The Chemical Age

A Weekly Journal Devoted to Industrial and Engineering Chemistry

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Contents

NOTICES:—All communications relating to editorial matter should be addressed to the Editor, who will be pleased to consider articles or contributions dealing with modern chemical developments or suggestions bearing upon the advancement of the chemical industry in this country. Communications relating to advertisements or general matters should be addressed to the Manager.

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Some Lessons from America

ONE listened with attention to the speeches of Sir Alexander Gibb and Mr. F. H. Carr at the pleasant reunion of the British chemical tourists this week to learn what points had occurred to them which might have escaped our own observation. In several particulars their views coincided with those already expressed in these columns—the warmth of the American welcome, the excellence of the organisation from beginning to end, the enjoyment and the educational advantages of the tour, the value to both sides of the personal friendships and acquaintanceships formed, and the general inspiration that follows from such stimulating experiences in two great countries like Canada and the United States. Their impressions included a few new suggestions well worth notice. It was welcome, for example, to hear Sir Alexander Gibb contrast, to our own advantage, the strained, unsmiling, deadly-earnest physical toil of the American labourer with the more cheerful temper in which the British workman does his task. We remember hearing the late Lord Leverhulme, in his fine Messel Lecture at Liverpool, lamenting in a similar spirit the suppression of personal pleasure in work resulting from modern industrial conditions as compared with the older English types—the jolly coachman of the olden days, the blacksmith singing at his anvil, the farmer whistling behind his plough, and so on. We certainly did not see many whistling or singing workmen during the trip; they were too intent to keep pace with the machines which they fed and which seemed to demand of them the last fraction of physical and nervous energy. Sir Alexander might have gone even further and said that around the furnaces, in the rubber, glass-making, and some chemical works we saw men engaged on jobs as strenuous and as unclean as any one could imagine, in temperatures trying even to the lightest-clothed visitor. Even in the lighter occupations one noticed the deadening effects of endless mechanical repetition work, done at high speeds, under the mass production system. Industry, it is clear, thrives enormously on these lines, but the conspicuous absence of elderly or even middle-aged men left one wondering how long the individual stands the pace; left one reflecting which is the better—America as a land to work in or England as a land to live in.

America's Live Young Men

MR. CARR, like Sir Alexander and many others, has returned impressed with the initiative and enterprise of American young men in the more responsible positions. He is not only impressed by the infectious enthusiasm of chemical workers for their subject, but believes it to be inspired not by love of money-making, but by a fine desire to extend the practical uses of science. Our experience is that in no country are the young men more frankly out to make money than in America, not necessarily for its own sake, for the American spends as freely as he earns, but for what money means to them, in order to get out of the drudgery stage as soon as possible, and to make a personal position fairly early in life. To this end they study, plan, and work in early days without stint. For the young American chemist has realised that the best way of making money is to do or invent something for the public that the public will think it worth while to pay for. What is called "Service" has thus become the universal test and slogan. In the case of societies, businesses or private enterprises, it is recognised that the more you give the public the more you get in return, and that if you provide a better chewing gum or newspaper, a shorter process or a better raw material, you establish a claim that the public will recognise. This theory perhaps is less idealist than the one suggested; at the same time it is in no way sordid or unworthy. There is indeed a certain sportsmanship in recognising that you must give before you receive, and the young chemical worker, like every other in America, is out very early to give

the public something new that will be of use to it, because he knows that that way lies success for himself. And by insistent advertisement and slogan the American public have been educated into playing the game; that is, when something new and better comes along, they must take it up.

No doubt both presidents had exceptional opportunities of judging, but the differences between American and British conditions are so wide that agreement in the impressions different people form is rare. Whatever the conditions, however, the deciding factor is generally found in personnel. There was great variety of type in the British party. It included directors of companies, professors, works managers, research and industrial chemists, civil servants, engineers, fuel experts, technologists of almost every kind. Remembering always that we saw the best of the American corresponding types under favourable conditions, while the British party was more casually selected, and making a comparison, man for man, between the American and British types as we recall them, was there much real difference between them and, if there was, on which side did the advantage lie? Here, again, opinions will differ, but at least it may be said that there is nothing in such a comparison to reduce one to despair. Each side would probably be found to excel in different respects, and both would probably agree that as they equally enjoyed each other's society and friendship, so they might equally gain from a merger of each other's best qualities.

The Swampscott meetings obviously impressed Mr. Carr, as they did all of us—the unity, the enthusiasm, the dimensions, the pride in the science and the industry. But the success of the American Chemical Society is regulated by the same test as that of any person or firm—the extent of its service to American chemistry. As one who knows its history well put it to us, "The old idea seemed to be to work and think for the Society through American chemistry. Later we found that the right way was to work and think for American chemistry through the Society, and while we continue to look after American chemistry as a whole the Society seems to look very well after itself." If that is the right policy for America, with its one great organisation for the whole country, it should be still more the policy for this country with its battalion of societies, all demanding separate members and separate fees. For the danger of too many societies is that they may become even more anxious about their own existence than about the purpose for which they were established.

A Duty on Foreign Dyes

We doubt whether the suggestion made by Mr. G. E. Holden (reported on another page) that the present "price factor" should be dropped at the end of this year, and that during the two years the Dyestuffs Act has still to run a duty on imported dyestuffs should be substituted for it will command much favour. If the Dyestuffs Act comes to an end in January, 1931, there would be considerable inconvenience in the interval caused by the abolition of the existing licensing machinery and the substitution of an entirely new form of protection. One argument in favour of the proposed change is that it would give a short period of practical experience of such a duty before the expiration of the Act. But of what advantage would such experience be if the Act and the limited protection it affords are finally to disappear some two years hence? In any case, one could hardly judge of the effects of any duty without knowing the details, and in this case no details are offered.

The one practical point in Mr. Holden's suggestion is that some joint attempt should be made to consider the position that will arise in January of 1931. The Government, it is pointed out, have given no indication of their intentions. Nor would such indications be conclusive, for the reason that the present Government may not be in power two years hence. If they are returned on a programme that includes "safeguarding" as a principal plank, they will probably think themselves quite justified in renewing the Act. The Liberal Party are clearly against the safeguarding policy, and the attitude of the Labour party is undefined, though Mr. Philip Snowden is as unconvinced a Free Trader as ever. It is not of much use, therefore, looking to political parties for a lead. What would be of advantage would be a practical round-table conference between manufacturers and consumers, and any other interests directly involved, with a view to drawing up an agreed statement of the steps considered to be most suitable. Such a statement, representing a collective view of the industries affected, could hardly be ignored by any Government. In any case, it would have the advantage of presenting for discussion a set of definite and responsible proposals.

The Great Nickel Merger

The principal interest in the reported great merger between the International Nickel Co. and the Mond Nickel Co. is not in its financial aspects, immense as those are, but in its importance to Great Britain's command of the nickel supplies of the world. For some time there has been keen activity in the shares of both companies, largely on the part of those who counted on profitable terms of exchange. The terms published, but so far not officially confirmed, show that prospective profiteers of this class have been disappointed, and the prices at once fell more to their normal value. In point of capital this merger would even exceed that of Imperial Chemical Industries, the total sum involved being stated to be 88 millions sterling.

From the national point of view, the arrangement is one of the highest significance, for it would give Great Britain command of the nickel supplies of the world. Those who joined the recent chemical tour through Canada and the United States will recall with interest their visit to the great works of the International Nickel Co. at Port Colborne, which gave them some idea of the scale of the company's operations. The International Co.'s process is essentially different from that of the Mond Nickel Co.—next week we hope to publish a chart of it—but while the latter company's process is regarded as much the shorter, the former company has very rich supplies of the metal in its Canadian mines. With a combination of their re-

sources both should gain immensely, and the British supplies would be safe against all challenge.

In Canada such a transaction would be welcomed with great satisfaction. No one can travel through the Dominion without hearing of the efforts of American interests to obtain control of a larger share of its natural resources, especially in minerals and water power, and of the regret felt by Canadians that British industrialists are not more keenly interested in Canadian developments. The United States would no doubt have gladly entered the Canadian nickel field, but Lord Melchett, if he has concluded the business with his usual decision and despatch, will have done the Empire a very good turn. Beyond this, the transaction would do good in drawing Great Britain's attention to the great undeveloped possibilities of the Dominion, especially in the electro-chemical field. and attracting further British interest and capital to its many industries.

Studies in Dyestuff Problems

THE West Riding Section of the Society of Dyers and Colourists is once more to be congratulated on the excellent programme of lectures just announced by the hon. secretary, Mr. W. P. Walker, at a successful preliminary meeting in Bradford. The opening address will be given on October 25 by Professor F. M. Rowe, D.Sc., F.I.C., of the Leeds University, under the chairmanship of Dr. H. Levinstein, president of the Society, the title of this address being "Colour Chemistry and Dyeing from the Academic Point of View." Professor Rowe stands alone in his wide knowledge of dyestuffs in their application, and his address is sure to be of great interest. Among the range of papers arranged may be mentioned an address by Professor H. E. Fierz-David, Ph.D., E.T.H., of Zurich, on January 17, 1929, on "The Analysis of Dyestuffs yesterday, to-day and to-morrow." A return visit is to be paid by Professor E. C. C. Baly, F.R.S., of the University of Liverpool, whose recent work on the new synthetic glass has caused a large amount of interest. The valuable addresses given by him over the past few years will render his visit on December 13 additionally attractive. A paper is to be given on February 7, 1929, by Mr. A. J. Hall on "The Action of Alkalis on Cotton and Artificial Silks," and Mr. W. E. Billinghame, of the Amoa Chemical Co., is to give another on November 8 on "Emulsions, their scope and application." The great importance of this subject, and the developments that have taken place in the theory of emulsions and colloidal solutions, will no doubt render this address worth the attention of the trade. In addition to a paper to be given by Dr. L. L. Lloyd, Ph.D., F.I.C., of the Technical College, Bradford, it is hoped that an address during the session will be given by Professor McSwiney of the School of Medicine, The University, Leeds, on work in connection with the standardisation of fastness tests which has been carried out under representative committees connected with the Society and in this instance particularly in regard to fastness to perspiration. The annual ball will be held in Bradford on January 25, 1929, and it is also hoped to arrange for a luncheon address during December of this year.

Books Received

THE ORDINAL OF ALCHIMY. By Thomas Norton. London: Edward Arnold. Pp. 125. 10s. 6d.

THE DISCOVERY OF THE RARE GASES. By Morris W. Travers. London: Edward Arnold. Pp. 128. 15s.

REPORT ON ECONOMIC CONDITIONS IN JAPAN. To June 30, 1928. By G. B. Sansom and H. A. Macrae. London: H.M. Stationery Office. Pp. 100. 3s.

INDUSTRIAL CHEMISTRY. By Emil Raymond Riegel. New York: The Chemical Catalog Co., Inc. Pp. 649. $9.00.

FIXATION OF ATMOSPHERIC NITROGEN. By Frank A. Ernst. London: Chapman and Hall, Ltd. Pp. 154. 12s. 6d.

The Calendar

Oct. 27	Society of Chemical Industry (South Wales Section): Visit to the Welsh School of Preventive Medicine, The Parade, Cardiff. 2.30 p.m.	Cardiff.
28–29	Faraday Society: General Discussion on Homogeneous Catalysis.	University, Cambridge.
29	Chemical Industry Club: Annual General Meeting. 8 p.m.	2, Whitehall Court, London.
29	University of Birmingham Chemical Society: "Anomalous Rotatory Dispersion." C. E. Wood.	University, Birmingham
29	Society of Chemical Industry (Yorkshire Section): "Asbestos and its Industrial Application," W. Bain. 7.15 p.m.	Great Northern Station Hotel, Leeds.
30	Sir John Cass Technical Institute: Lectures on Chemical Plant. III. Crushing, Pulverising and Grinding. William Bullock. 7 p.m.	Jewry Street, Aldgate, London.
30	Hull Chemical and Engineering Society: "The Commercial Testing of Engineering Materials." Professor G. F. Charnock. 7.45 p.m.	Grey Street, Park Street, Hull.
30	Royal Institution of Great Britain: "Co-Aggregation versus Continuity in the Change of State from Liquid to Vapour," Professor H. L. Callendar. 5.15 p.m.	21, Albemarle Street, London.
31	Society of Chemical Industry (Newcastle-on-Tyne Section): "Recent Investigations of the Properties of Coke." Professor H. V. A. Briscoe. 7.30 p.m.	Armstrong College, Newcastle-on-Tyne.
31	Faraday Society and Electroplaters' and Depositors' Technical Society. Joint meeting. 8.15 p.m.	Northampton Polytechnic Institute, London, E.C.1.
Nov. 1	Chemical Society: Ordinary Scientific Meeting. 8 p.m.	Burlington House, Piccadilly, London.
1	Society of Chemical Industry (Bristol Section). Joint meeting with the Chemical Engineering Group: "Glycerin and its Substitutes in Industry." W. F. Darke and E. Lewis. 7.30 p.m.	University, Woodland Road, Bristol.
2	Society of Dyers and Colourists, Institute of Chemistry, Society of Chemical Industry (Manchester Sections) and the Chemical Section of the Manchester Literary and Philosophical Society: "Applications of Chemistry to Modern Farming." Sir John E. Russell. 7 p.m.	17, Albert Square, Manchester.
5	Institution of the Rubber Industry: "Recent Progress." Dr. T. J. Drakeley. 7.30 p.m.	Lever House, New Bridge Street, London.
6	Institute of Metals (Birmingham Section): "Drop Forging and Machine Forging." F. W. Spencer. 7 p.m.	Engineers' Club, Waterloo Street, Birmingham.
6	Institute of Metals (North East Coast Section): "Deformation of Metals." Professor C. H. Desch. 7.30 p.m.	Armstrong College, Newcastle-on-Tyne.
6	Sir John Cass Technical Institute: Lectures on Chemical Plant. IV.—Centrifuges and Hydro-extraction. Brian L. Broadbent. 7 p.m.	Jewry Street, Aldgate, London.

Memories of the Chemical Overseas Tour

A Jolly Reunion in London

WHEN the recent tour to Canada and the United States was drawing to a close there were many suggestions that the members, after their return, should arrange a reunion in London. The idea, thanks to the excellent organisation of Mr. H. J. Pooley, was successfully carried out on Monday evening, when some 160 members of the party and friends dined together at the Criterion Restaurant. It was a very jolly evening; it could hardly have been other than jolly with Mr. Harold Talbot in the chair. He directed the proceedings with magnificent authority, pronounced the tour to be a unique event in the history of the societies concerned, and supplied a most discerning analysis of the composition of the party, embellished, in some cases, with courtier-like compliments, and in others with highly actionable personal allusions. The only other speakers were Sir Alexander Gibb and Mr. F. H. Carr, who shortly summarised their impressions of the tour and mentioned points of particular interest. While generous in their acknowledgment of American hospitality and of the merits of the American industrial system, one was glad to gather that England had still, in their view, a few points to the good. Among those present was Prince Conti.

An Exhibition of Photographs

The rest of the evening was given up to an exhibition of photographs taken by members. Mr. Carr first showed a series of slides he had prepared from photographs taken by Mrs. Thorpe. These contained one magnificent example of still life—a photograph of her husband, Professor Thorpe, calmly asleep on a seat, with his inevitable cigar. It is curious how the Professor, most unobtrusive of men, gradually emerged as a recognised pillar of the party. His presence was a daily, almost hourly, reassurance that all was well; at the mere sight of him even the fussiest ceased from troubling. Next, Professor Hinchley took up the story and showed a variety of pictures sent in for exhibition or taken by himself. Before he had finished, Mr. J. M. Leonard started a rival film show at the other end of the room, and both shows went on simultaneously. Mr. Leonard's film, with its clear illumination, was a great success. It showed us the tour in large glimpses—the passage out of Southampton Water, events on board, the passing of the icebergs, the arrival at Quebec, and beautiful stretches of Canadian scenery. These recalled with a very quickening effect one's memories of the trip, and they were happily interspersed with personal incidents and characters. Nothing was more beautiful than the close-up views of that incomparable trio of wholesome young Englishmen, Messrs. Banks, Potter, and Dickins, who, with Mr. Leonard himself, made such jolly travelling companions. This film, of which only about half was shown, would be very well worth an evening to itself, say at the Chemical Industry Club or other suitable meeting place. At eleven o'clock, when the party separated, the pictorial matter was still far from exhausted.

An Analysis of the Party

The CHAIRMAN (Mr. H. Talbot), in opening the proceedings, thanked Mr. H. J. Pooley for so successfully organising such an interesting gathering to hear an account of a tour that was already recognised as a unique event in the history of the three societies concerned. He had attempted an analysis of the composition of the party, which appeared to have included all that was brightest and best in British chemistry and chemical engineering. In point of numbers and importance, Imperial Chemical Industries sent the largest representation; it included almost every variety of chemist, engineer and works manager, and with the other personal and firms' representatives made up a remarkably complete party. Then they had representatives of another big closely allied industry, the gas industry; such well-known gas engineers as Mr. J. G. Clark, Gas Light and Coke Co., and Mr. J. W. Napier of Alloa, and gas and works chemists such as their well-known friend Mr. Parrish of the South Metropolitan Co., Mr. F. M. Potter, of the rival organisation, and Dr. Pexton, who, he understood, went out partly as a research chemist and partly as a bridegroom. The Coke Oven Managers' Association was represented by Messrs. Finn, Hebden, and Nicholson, a Yorkshire trinity unapproachable in all sorts of ways. The wealthy leaders of industry, especially chemical engineering, were represented by influential and charming people like Mr. J. A. Reavell, already popularly known in America as "Sir Arthur." Pure science was represented by a group of very eminent and weighty professors, and the secretarial position was ably filled by Dr. Colgate, who was accompanied by Mrs. Colgate, but who seemed, judging by the photographs he had seen, to have had several Mrs. Colgates with him. Then, among other industrial and scientific notabilities came Dr. W. Cullen, Dr. Jordan, Dr. Percy May, Dr. Morrel, and Mr. F. A. Greene. Lastly, he must not omit to mention a distinguished representative of the technical press in Mr. Hamer. No one on earth ever looked less like the editor of a technical journal than Mr. Hamer; opinion was about equally divided as to whether he was a bishop or a bookmaker. Lastly, they had their two excellent presidents, Sir Alexander Gibb and Mr. Francis H. Carr. Having thus shortly epitomised the general character of the party, was it any wonder that a body so numerous and so representative should have required several vessels and trains for their journey, and should have left such a deep and favourable impression on their American hosts and on the entire Press of Canada and the United States?

Sir A. Gibb on U.S.A. Labour

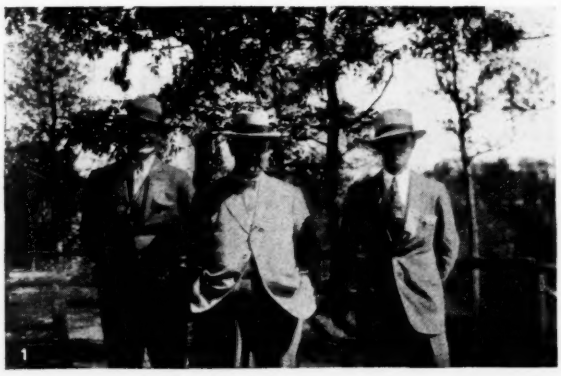
Sir ALEXANDER GIBB, in giving some impressions of the tour, described the trip as an unqualified success. There had been some criticism that the number taken over was too large. If it had been a trip to Great Britain he would have said "Yes"; in the case of America, he would say "No." The only people who suffered from the size of the party were their American hosts, and at no time did they disclose any sign that their guests were too numerous. In fact, they took all the visitors, young and old, under their wing and made them feel that they were exactly the number they expected. Although the money spent on the visitors must have run into several thousands, it was spent ungrudgingly and given with absolutely good grace. At every point, in fact, the Americans proved perfect hosts.

No member of the party could have seen what they were shown of Canada without being impressed with its tremendous possibilities and without feeling that the Canadians would far rather look to Great Britain than to America for help, but they could not help feeling also that Great Britain was not doing as much to help Canadian enterprises as America was. British chemists and engineers might look to Canada of the future as an outlet for their work, ability, and capital, and there could be no doubt that that attitude would be cordially welcomed in Canada.

In America they were struck by its extraordinary prosperity, the ease with which they got money to put into new enterprises, and the light-heartedness with which they scrapped plants that did not pay or were becoming out of date. Was there not a lead to themselves in that matter? Americans might, in some ways, seem a little too new-fashioned in their ideas, but Great Britain might well take a leaf out of their book. With regard to American labour, it struck him that the American workers did not seem ha f so happy at their work at the British workman; they looked strained and seemed concentrated on their job. Over here the working people smiled at visitors and seemed glad to see them. The American worker did not seem to notice them and had no time to spare from his work. In spite of that, he believed that the British workman produced per unit per man more than the American. With regard to management, he did not feel quite so sure. He was inclined to think that the young engineer or manager in America was keener than the young engineer or manager here. Some might say "No," but he thought the young American realised early that he had got to work and could not afford to wait until his father died. In point of management, the Americans could give us a lesson, but in operatives he thought we were better than they.

If the members of the party did not learn anything from their visit it was their own fault, and all were deeply grateful to their American hosts for what they had done. A feeler had been put out as to a return visit, say in three years' time.

Photographs of the British Chemical Party on Tour



1. Three Young Fellows at Niagara Glen 2. The three Presidents with Mrs. Thorpe, Mrs. Carr, and Miss Carr. 3. The Party at the Country Club House, Akron. 4. Shawinigan Falls. 5. Kirkland Lake Mining Camp.

He hoped they would come and that an effort would be made to give them an equal welcome. The tour in the first instance was got up by the chemical engineers. They were rather short of numbers and appealed to the Society of Chemical Industry to help them. They did so most nobly, and from beginning to end, the help, sympathy, and co-operation received from the Society and from their worthy colleague, the president, Mr. Carr, could not have been surpassed. "I am," said Sir Alexander, in conclusion, "practically a teetotaller. I thought it extraordinary what little difference prohibition made. One did not miss alcohol a bit, and my affection for iced water was unsurpassed."

Mr. Carr's Impressions

Mr. F. H. CARR, after paying warm tributes to Sir Alexander Gibb and Professor Thorpe, whose presence helped to make the tour so happy and successful, said that if those who took part in the American visit were asked "Did you have a good time? Was it worth while? Was it a success? Are you glad you went?" the answer would be a simple affirmative, but to the question "What did you do and what did you learn that is of importance to British chemists?" the reply could not be given in a monosyllabic affirmative, nor, indeed, in the few words expected from him that evening. He welcomed the opportunity, however, to convey to those chemists present who had not been lucky enough to join in the visit something of the wonderful experience they had had and the message of warm friendship and unity which their American friends had charged them to bring back. Of the many valuable things gained by the trip, this was to be the most highly prized.

It was 16 years since the Society last visited its American Section—16 years which had witnessed more change and development as regards applied chemistry than any other like period. During that time American chemical production had risen from an insignificant figure to upwards of 500 million pounds turnover per annum at the present time. This fact alone might have meant in any country but America that the Society would have been met with a feeling that there was no longer a place for it. Instead of that, on every hand they were convincingly made to feel that their Society belonged to America as much as to Great Britain, and both in the United States and in Canada the friendship and hospitality extended to its members had been unlimited. Since his return he had received from Dr. Redman, a most delightful personage, who was chairman of the American Section last year, a letter in which he said:—"I am sure that the meeting here was of great value to the American chemists, and we enjoyed more than we can tell you the friendships which have been renewed and formed. If the British chemists have enjoyed it as much as we have here in America, we will pronounce the meeting a success." That friendship with their American cousins, said Mr. Carr, was a thing of great importance to British chemists.

The opportunities before the young scientific worker in America went far beyond what we were familiar with in this country, and among the qualities that had aroused the visitors' admiration was their infectious enthusiasm for their subject. This enthusiasm was not restricted to using science for the purpose of making money, but was directed to the application of science for its own sake and for the benefit of civilisation. While it might be said that the chemists of America had succeeded in greater degree in the application of chemical science than in the promotion of research in fundamental knowledge, their interest was by no means limited to applied chemistry, and some of the greatest discoveries in pure science had been made there within the last decade. It was important to realise that the live splendid young fellows they met in America were going to go a very long way, and that we might be left behind unless we caught something of their enthusiasm. During the meetings at Swampscott they saw 2,000 chemists meeting together to discuss their subjects with a freedom in the exchange of their knowledge and a lack of jealousy quite unknown in this country, and he wished it were possible to unify the chemical organisations in this country in the same way. There had been some criticism, for which he contended there was no foundation, that their numbers were too large and that the party contained too many young people. On many occasions, on the contrary, exactly the reverse opinion was voiced; they were received everywhere with the greatest enthusiasm and friendship, and the visit had left something in the hearts of their young men that would last for generations, and be of the greatest possible value to them. He considered it a very great success to have taken so many young men out with them.

Dr. COLGATE, before the meeting ended, read a message from Mr. H. C. Parmelee, New York, testifying to the great success of the tour and to the pleasure the visit had afforded their American hosts.

A National Aeronautical Laboratory

To the Editor of THE CHEMICAL AGE.

SIR,—After the lessons of the war, in regard to the value of scientific experiment, it was said this country was to turn over a fresh leaf and encourage systematically those who came forward with new ideas. We are afraid, however, that in many cases it is little more than lip service we are still paying in this country to invention and research.

Take aeronautics. Daily we are brought into touch with inventors. Many, we find, are devoting their ingenuity towards solving problems in aviation. Many, too, ask our advice as to having their inventions tested without delay in an independent and technically conclusive way. What can one say? The Air Ministry has too small a grant for purely experimental work. It is unable, for lack of funds, to explore many avenues which its experts seek urgently to traverse. It cannot be expected to have time or funds for investigating promptly, on an experimental basis, a large number of outside ideas. As for aircraft industry, it has as much as it can do, generally speaking, to keep its head above water, and certainly cannot devote the time it would like to experiment.

Inventors are between the devil and the deep sea. Officially we starve aeronautical research, while our firms, with a few exceptions, are unable to bear the burden of experimental work.

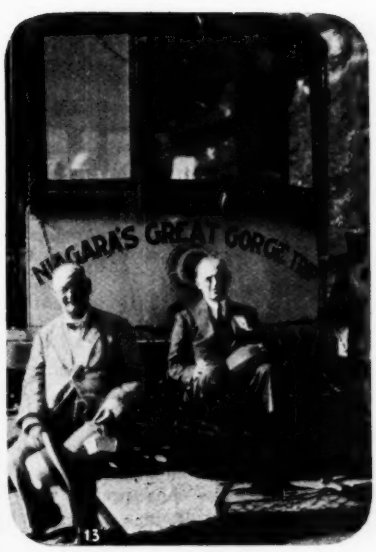
In Germany, where they lead the world in air research, arrangements are made officially whereby laboratories all over that country—chiefly those connected with universities—are in a position to investigate any and every idea of private origin which seems worthy of being tested. It is agreed that aviation is vital to the Empire. That being so, we suggest that it is essential that there should be in this country some central completely-equipped laboratory and experimental station staffed by experts whose sole task it would be to probe thoroughly, and immediately, every new air idea submitted by inventors for its consideration. It should be in a position, also, to conduct full-scale trials in cases where these were justified. One realizes that many schemes submitted would be unworkable. But we are perfectly certain that it would repay a thousandfold to foster, rather than neglect, the clever brains outside official or trade circles which are now seeking so ardently to improve the speed, safety, and practicability of aerial travel.—We are, etc.,

C. W. BRETT (Barimar, Ltd.)

18, Lambs Conduit Street,
London, October 22, 1928.

Lord Melchett's Visit to Canada

WE have just had a visit from Lord Melchett (*Canadian Chemistry and Metallurgy* states). He has been interviewed by the usual run of representatives of the daily press on everything from titles to farming, but they all seem to miss the part that science has played. Such was not the case in other conferences. Chemistry is so definitely a part of the Mond family that it is not necessary to discuss with chemists the fruits of brilliant efforts in research, and the return that has followed a faith of more than one generation in chemical industries. While the Canadian public will associate our distinguished visitor with the nobility of England, British politics, problems in labour and emigration, and the nickel mines of Sudbury, it remains for chemists to note that applied science and chemistry was the first sign-post on the way which led to the present gigantic position of responsibility and trust, now occupied so nobly. A long list of famous names in industry could be mentioned, and, in every case, it might well be stated that the acceptance of chemistry was a large element in the success that the world now recognises.



6. On The Lincoln Memorial Steps, Washington. 7. Stokes Mortar Demonstration at Edgewood. 8. Dr. Colgate and Mrs. Hopkins. 9. Party at Mrs. Langmuir's Cottage, Niagara. 10. Gas Mask Drill at Edgewood. 11. Messrs. Finn, Potter and Hebden in Gold-mining kit. 12. Chateau Frontenac, Quebec, from the Citadel. 13. A Halt by the Rapids.

Action Against B.D.C.

Damages Claimed for Breach of Agreement

IN the Chancery Court, Manchester, on Tuesday, Lionel Blundell, of Prestwich Park South, brought an action against the British Dyestuffs Corporation, Ltd., claiming damages for breaches and wrongful repudiation of agreements. Mr. C. Atkinson, K.C. (for plaintiff), said the action related to an agreement which experts declared might have been worth £100,000 to Mr. Blundell. He had, in fact, been offered £50,000 for it. Mr. Blundell was managing director of the North British Chemical Co. (England), Ltd., and held 31,402 shares out of the 33,502 issued shares. His wife held the others.

Mr. Atkinson said that plaintiff had a number of formulæ which the defendants desired to get hold of. An agreement was provided that he should furnish full and detailed instructions as to the manner in which dyestuffs were manufactured. Consequent upon this agreement, the North British Chemical Co. was to dismantle its dyestuffs manufacturing plants, and cease to produce dyestuffs. The agreement was for five years, and would afterwards continue until either party gave six months' notice.

Mr. Blundell carried out his part of the bargain, the plant of the Chemical Co. being sold by auction in October, 1927. The secret processes were disclosed, and the defendants took over the services of the chief chemist and works manager in order that they might show them the proper method of manufacturing the dyestuffs.

Revision of Agreement Asked

Defendant's solicitors then wrote plaintiff pointing out it was necessary to make some revision in the agreement, but the plaintiff objected, whereupon the defendants insisted that the agreement must go through in the amended form or not at all. Mr. Blundell commenced legal proceedings, and, after the writ had been issued, the defendants, through their solicitors, agreed to execute an agreement in the form contended for by the plaintiff, to pay such damages as might be found due to him upon an inquiry, and to supply the plaintiff with dyestuffs. They afterwards repudiated that agreement.

The defendants' case was that they had been willing to execute an agreement which embodied schedules agreed to by plaintiff, but he had submitted schedules which were widely different and refused to accept the form the defendants proposed. It was admitted that the letters which passed constituted a concluded agreement, but if they did it had been repudiated by the plaintiff himself.

Mr. Blundell, giving his evidence in chief, at the resumed hearing on Wednesday, gave a detailed account of interviews he had with representatives of the Corporation after July 27, 1927. On August 4 he had a discussion about a new dyestuff he had discovered, and another dyestuff was casually mentioned towards the end of the interview. Nothing was said about prices. On the following day he saw Mr. Whetmore, the commercial manager, and discussed points with him. Mr. Lambert, the assistant secretary, suggested it would be a good idea to have a round-table conference about the matter with their solicitors, and it was arranged that such an interview should take place.

Allegations Denied

It was not true, as had been alleged by the defendants, that at the close of the interview it was agreed the prices should be those set out in the document sent to his solicitor on September 27, and that Clause 3 in the draft agreement (which dealt with the prices) should be revised accordingly. Between July 27 and September 27 there were no discussions of the nature alleged.

As the defendants persisted in the refusal to execute the agreement unless he consented to the alterations proposed, he commenced the action in the Chancery Court. Letters passed between the solicitors, and in December the defendants agreed to execute the agreement and, pending the execution, to supply him with dyestuffs on the basis of the terms thereof. On January 10, 1928, he commenced working under this arrangement, but, after the first conversation on the telephone, he came to the conclusion that something was radically wrong. He wrote several letters calling attention to this very unsatisfactory condition of things, and asked for assurances that matters would be dealt with in a proper, businesslike manner.

Cross-Examination of the Plaintiff

In cross-examination by the Hon. R. Stafford Cripps, K.C. (for the defendants), the witness said the business he did with the Corporation had been increasing, and he gave up the manufacture of certain lines, preferring to buy them from the Corporation.

Your business was in financial difficulties?—Only temporarily.

You were the person who suggested that you should abandon manufacturing and take up a merchanting agreement?—Yes, prompted by suggestions from the Corporation.

You were the first to suggest it?—Yes.

As a matter of fact, you had long been playing with the idea of selling the works to the Corporation?

The witness said they had been talking about it since 1924. When the Corporation decided that they would not buy the works he put forward the suggestion that he should abandon manufacturing. He was anxious at the time that this question should be settled at the same time as the settlement of his liability to the Corporation.

Mr. Cripps: The Corporation stated quite clearly throughout the negotiations that they did not want to mix up your indebtedness with the question of the agreement?—The secretary adopted that attitude, but Mr. Whetmore did not.

Mr. Cripps: From time to time everyone who manufactures dyestuffs has to make some very special concession in order to avoid an import licence?—There are times when the manufacturer has to do that.

And very often that may entail selling at a good deal below cost?

The witness replied that it was possible. He himself had never sold at a loss, except after the Corporation broke their agreement. When he was a manufacturer he did not sell at a loss.

The cross-examination had not concluded when the court adjourned.

A Settlement

At the close of the plaintiff's case on Thursday, Mr. Cripps said defendants would not call evidence. Subsequently, Mr. Atkinson said a settlement had been reached. All imputations against defendants were withdrawn, and plaintiff accepted a lump sum in settlement of all claims. Each side would pay their own costs. Defendants promised to renew trading relationships and to treat plaintiff favourably.

Safeguarding Theories

To the Editor of THE CHEMICAL AGE.

SIR,—The present phase of the fiscal controversy is becoming as notable for what Mr. Baldwin might well call the "many-sidedness of truth," as was its precursor in pre-war days. When safeguarders congregate, their unanimity is wonderful, but when their testimony is taken separately we get strange diversities, as for instance:—

> "By safeguarding we have built up new and vital industries. We have built up a chemical industry second to none as the result of our policy."—Sir P. Cunliffe-Lister, President of the Board of Trade, Norwich, September 28, 1928.
>
> "The only branch of the chemical industry which is safeguarded is that of fine chemicals, which employs, and never is likely to employ more than, a trifling percentage of the total number engaged in the industry."—Mr. H. G. Williams, Parliamentary Secretary to the Board of Trade, House of Commons, March 21, 1928.

It is odd that the two Parliamentary representatives of a great State Department should thus give the lie to each other, but perhaps there is an explanation.—Yours, etc.

H. E. CRAWFURD.

House of Commons.
October 22.

Danish Fertiliser Imports

DANISH IMPORTS OF FERTILISERS in the first half of 1928, as compared with 1927, were as follows (in tons): superphosphate, 84,243 (66,248); Thomas slag, 3,240 (1,706); calcium nitrate, 71,251 (71,504), including 53,025 (53,521) from Norway; Chile nitrate, 27,951 (19,672); calcium cyanamide, 449 (347); ammonium sulphate, 15,383 (24,854); kainite, 741 (258); and potassium salts (37 per cent.), 22,856 (17,222).

Colour Standardisation and Testing

Views of Oil and Colour Chemists

At a meeting of the Oil and Colour Chemists' Association at the Royal Society of Arts, London, on Wednesday, October 17, a discussion took place upon the problem of colour standardisation and testing. The President (Dr. J. J. Fox) presided. The meeting was intended as a continuation of a discussion on the same subject last session.

Dr. L. A. Jordan, who opened the discussion, dealt with the possibilities of the application of scientific methods of measurement to colour in the paint industry. The use of the word "standardisation" was unfortunate, though he was unable to suggest anything better, except the word "measurement." There seemed to be a fear that standardisation would lead to restriction, but the suggestion of limitation of commercial activity in these matters was a false doctrine, though he feared it was frequently in people's minds. They wished to develop some sort of order out of the chaos in which the technique of the pigmentary colour-using industries stood. A year ago he referred to the instruments available for colour measurement, and had emphasised that they ought to be used by the technologist, but that between precision and factory practice there was a great gap. His appeal was for help and guidance in closing that gap, which was a work that industry itself must do. During the past year at Teddington some little progress had been made with regard to colour investigations. A colour laboratory had been built and up to a point equipped, and colour investigation work was going on continuously. He referred to a number of instruments in use, and said that in the future there would be much more development on these lines, for the photo-electric cell was the artificial eye, which might sometimes be more certain in its action than the human eye. In general it was recognised by all authorities that the accuracy of visual spectrophometry was not quite good enough. In the work carried out by his Research Association on the Guild instrument it was found that the first problem was how to present the sample of paint to the instrument, because the surface condition (the gloss) interfered with the correct evaluation of the colour. This was easily explained scientifically, but it was a real practical difficulty and disadvantage. One would like to dissociate each record into the "true" colour component and the "gloss" component.

Effect of Atmospheric Influences

Dr. S. G. Barker referred to the effects of atmospheric influences on the fading of colour, and said that recent work in the Woollen Research Association's laboratories had shown that temperature had a very distinct influence. Over a range of temperature of 40 deg. C. the fading at the higher temperature was considerably greater than at the lower. In the case of Soluble Blue, there was approximately 75 per cent. greater loss of colour at 50 deg. C. than at 10 deg. C. As to the rate of fading, it had been shown that for a large number of dyestuffs the amount of fading was approximately proportional to the square root of the time of exposure. This had now been mathematically proved, but did not account for the fact that in the earlier stages of fading the amount of loss of colour was approximately proportional to the time. A formula of great practical importance had been evolved, giving not only the amount of fading due to time of exposure, but also the regain of the fabric under test. Thus the equation connecting fading, time and regain for any given dyeing could be obtained for each dyestuff, and from this it was possible to calculate the amount of fading that would take place at other regains and for other times of exposure. To the trade, this was of the utmost importance, in that one was now able to estimate the amount of fading under known standard conditions of humidity and temperature in the fugitometer, which was designed by the Research Association, and from the formula given the action of other temperatures, times, and regains could be predicted. This method was being tested out fully, and it was hoped that it would be possible to relate the laws enunciated to other colour problems.

Mr. H. Jackson (British Dyestuffs Corporation) emphasised the difficulties existing between buyers and sellers of colours owing to the lack of standardised methods of preparation and testing. Dyestuffs which the manufacturers found to be correct were stated by the buyers to be weak. He instanced a light-fast scarlet—a straight pigment—which the Corporation had been making for years, but in regard to which dispute arose occasionally on the ground that the colour was weak. He exhibited a panel, on one side of which the commercial quality material was applied, and on the other the same material after recrystallisation to ensure purity. The colour of the recrystallised dyestuff was deeper than that of the commercial quality, and the recrystallised dyestuff was apparently weaker. Different manufacturers used colours in different ways, and it would be a great help if standard methods of testing could be devised, so that the sellers and the buyers of dyestuffs would know that each was applying the same tests. The trade was, in his opinion, in a very serious position owing to the lack of standard methods of testing. There were differences of opinion as to the properties which should be possessed by colours suitable for cellulose lacquers, for instance, and he suggested that there should be formed a committee of manufacturers and users to discuss such problems and to draw up a list of problems upon which the Research Association might be asked for enlightenment.

Mrs. Lovibond, speaking of the standardisation of paint colours, said that what was wanted was the recognition of a standard method both of measurement and expression. A great step forward would be made if the Association made practical tests of all the colorimeters in existence, compared the results, and decided upon the simplest and most consistent method.

Mr. Fawcett said the discussion had centred around the difficulties of the standardisation of colour, but rather more stress should be laid upon the necessity for standardisation of the conditions and the specification of the apparatus which had to be used for carrying out the tests.

The President pointed out that the standard instrument in this country for measuring colour was the Guild colorimeter.

Standardisation of Methods and Units

Mr. J. Guild said that what he meant by "standardisation" was not the standardisation of colours, but the standardisation of the methods of measuring colour and the units by which the results were expressed. Discussing Dr. Jordan's point as to the effect of gloss, and the most desirable conditions of illumination for making colour measurements, he said that whether one made measurements by means of a colorimeter or by spectral analysis, the results depended on the method of illumination and the conditions of observation, and it was necessary to decide which was the most advantageous form of illumination and observation. With regard to the difficulty in the measurement of fading, owing to the change in the gloss on the specimen, he suggested coating the paint specimen before test with a suitable varnish, so that the surface condition of the faded specimen would be the same as that of the original specimen.

Mr. New said that in the presentation of a sample to the measuring instrument one was up against the question of particle size and refractive index of the lumps of coloured material. The problem was more complex in the case of pigments than in the case of dyed fabrics, because in the latter there was some sort of uniformity, whereas with pigments there was discontinuity everywhere.

The President said that whereas previously no one could say definitely that he had got a colour really matched, we were now in a position to put a figure to a particular hue or shade and to say what was the amount of colour represented by red, green, and so on, and what was the amount of white light in the mixture. Unless we could fit numerical values to our colours we should not get very far. The Oil and Colour Chemists' Association could not carry out tests of instruments, but the Research Association was a very live organisation, and would welcome means whereby it could increase its activities.

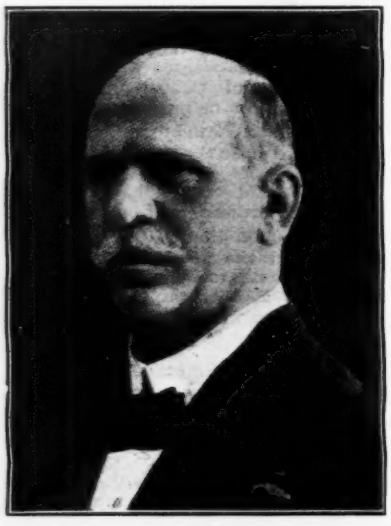
Dr. Jordan, replying to the discussion, said that the only thing needed to enable the Research Association to increase its activities was money.

Death of Dr. Emile Bronnert

A Great Artificial Silk Chemist

By the death of Dr. Emile Bronnert, of Strasbourg, which took place on Thursday, October 18, the artificial silk industry loses one of its notable pioneers and inventors. While his studies included all the recognised processes, his name is principally associated with the cuprammonium process which he was largely responsible for converting into a commercial success. He collaborated in building up the Glanzstoff concern of Germany, with its subsidiary the British Glanzstoff of Flint, whose works were afterwards taken over by Courtaulds, and the first Oesterreichische Glanzstoff-fabrik of St. Poelten. He combined the patience of a research worker with the energy of a commercial man, and played a great part in the scientific and commercial development of the artificial silk industry. His brother, Mr. Henry Bronnert, is a well-known Manchester merchant and has been associated with several of his enterprises.

Born at Strasbourg in 1868, Dr. Bronnert graduated at the university of his native city. He collaborated with Professor Noelting-Schoen, the director of the College of Industrial Chemistry at Mulhouse. For five years he worked in his own private laboratories and then, thanks to the support of manu-



Dr. Emile Bronnert.

facturers in Alsace, produced artificial silk first in Switzerland and then in Mulhouse. The importance of Dr. Bronnert's early work attracted the attention of Count Chardonnet, who enlisted his help in solving problems which then faced him. Dr. Bronnert set to work to improve Chardonnet's system of manufacture, which at the time was recognised as very defective and extremely costly. He succeeded in producing collodion which was not explosive, did not have the ill effects of the costly ether, and was much cheaper to make. Count Chardonnet recognised him as his collaborator. Dr. Bronnert then turned his attention to cuprammonium silk, following the line of Despaissis by making use of the known solubility of cellulose in cuprammonium. Here, again, his efforts met with success. He built the Stapel fibre factory at Sydowsaue and organised the Bayrische Glanzstoff at Obernburg-Elberfeld, the first Bohemian Glanzstoff at Lovosice, Czecho-Slovakia, and the Asahi Silk Weaving Co. at Ze Ze Cho in Japan. The acetate cellulose process was also evolved in part by Dr. Bronnert when in its early stages. As early as 1897 a sealed paper was deposited by him at the Société Industrielle de Mulhouse. This paper was published in 1912, and outlined the process which has since been used for the easy production of cellulose esters by means of acetic acid. He was also successful in his researches regarding the formic ester of cellulose, being able to make it serviceable for the industry of artificial fibres and for plastic materials. When in 1912 the viscose process was emerging, some of the most important improvements and new processes were due to him. Subsequently, further investigation on his part resulted in the revolution of spinning conditions, permitting of the production of almost any fineness of filament. To these were added the processes of Lamposage used by the Soieries de Strasbourg.

A member of an old French family, Dr. Bronnert returned after the war to Strasbourg and founded the well-known laboratories of the Lampose group of artificial silk mills. In 1924 he founded the Soieries de Strasbourg, whose factories are on the banks of the Petit-Rhin. In 1926 a distinguished gathering of scientists and public men assembled for the inauguration of these factories, erected on a site which, only a short while before, was a military exercise ground. He also equipped the great American factories of the Skenandoa Rayon Corporation, and the Kurashiki Rayon Spinning Co. in Japan.

For much of this notice we are indebted to an article in *The Silk Journal*, by Mr. Arnold H. Hurd.

The Future of the Dyestuffs Act

Suggested Duty to Replace Price Factor

A SUGGESTION that a duty on imported colouring matter should be imposed in place of the present price factor, during the continuance of the present Dyestuffs Act, was made by Mr. G. E. Holden, chairman of the Manchester Section of the Society of Dyers and Colourists, at a meeting on Friday, October 19.

The functioning of the Dyestuffs Act, Mr. Holden said, was a matter of considerable interest to the dyeing industry, and that interest was likely to continue owing to the problem of securing an adequate supply of colouring matters at reasonable prices. The Dyestuffs Act came into being in January, 1921, and should end automatically in January, 1931. Reviewing the main methods by which licenses to import dyestuffs were granted he said that, firstly, the application to import a foreign colouring matter must be made in a prescribed form, and applications could only receive consideration when there was no product available of British manufacture equal in quality to the one of foreign origin that it was desired to import. Secondly, there was the all-important factor of securing the desired product at the lowest possible price. The price was governed by the " Two Times " factor, which meant that any application to import would not receive consideration unless the British equivalent was more than double its pre-war price.

Having been associated for the last seven or eight years as a technical adviser of the committee concerned in the granting of licences, Mr. Holden said he had been impressed during that period by certain features of the work. Undoubtedly, the committee had carried out their duties very well and had succeeded in giving satisfaction generally. Many members of the society were doubtless wondering whether the period of protection at present accorded to the British dyestuffs industry would be extended for a further number of years, or whether the protection would be dropped altogether by 1931. It would almost appear from the optimism expressed by highly placed members of Imperial Chemical Industries that further protection would not be required; at any rate, they had conveyed the impression that they would regard it as somewhat undignified on the part of a firm of high standing to ask for any assistance by way of tariffs. Personally, he would like to see the price factor dropped altogether by the end of the present year. Under the Act it would have to be dropped early in 1931, and if any rearrangement had to be brought about it would be better to commence it at once. He suggested that the present procedure should be displaced at the end of the present year by the imposition of a reasonable duty on imported colouring matters, the exact terms of which would be agreed upon by the licensing committee. Such a duty on imports could be allowed to operate for the remaining two years of the life of the Dyestuffs Act. By introducing this variation in the operation of the Act there would be a short period of practical experience of such a duty before the expiration of the Act. The issue was of great importance, but it was not clear whether proper steps would be taken one way or the other to decide the matter. Everyone concerned would like to see a clearly defined course marked out, and it was the absence of any indication as to the intentions of the Government that prompted him to offer the suggestion of a two-years' preliminary trial as an alternative method of procedure.

Society of Dyers and Colourists

Technical Papers at the Manchester Section

AT a meeting of the Manchester Section of the Society of Dyers and Colourists, held on Friday, October 19, the chairman (Mr. G. E. Holden, M.Sc. Tech., F.I.C.), read two papers, one on "The fixation of pigments on textile fibres," and the other on "Some effects produced by the singeing operation in the dyeing properties of cotton."

Fixation of Pigments to Textile Fabrics

Mr. Holden stated that previous research work conducted by Professor Guy Radcliffe and himself had encouraged him to conduct a lengthy series of experiments with the further object of determining the capacity of linseed oil to affect the fixation of various pigments, when applied on the industrial scale to textile fabrics, chiefly cotton velveteens. The investigations involved the inclusion in the general scheme of not only the application of linseed oil in the raw state and the boiled state, but also of other well-known products such as China wood oil, spermaceti wax, carnauba wax, bees' wax, gelatin, isinglass, and acetyl-cellulose, as well as most other possible products.

The scientific portion of the work concerning the speed and degree of the autoxidation of linseed oil under various conditions formed original work not previously touched upon to the same extent by other investigators in any publication on the subject. The present investigation extended over several years, 1916-1923. Among the several pigments which were used industrially in association with linseed oil, prussian blue was regarded as the most important for the purpose of the present investigation. This pigment was also employed for the same reason in association with the other products separately. Furthermore, the term "fixation" as applied in relation to prussian blue, was regarded as implying, in the case of textile fabrics, the maximum degree of freedom from "rubbing off" or "marking off."

In accordance with the scheme of working arranged, the initial experiments in the direction of associating prussian blue with linseed oil and the several other products separately, were carried out by employing glass plates as the foundation. The results gave definite indications of the procedure to be followed in conducting the work on cotton velveteen. In seeking to determine the amount of prussian blue fixed under definitely controlled conditions by each of the several products named, it became necessary at the outset to submit the products employed to complete analysis.

Mr. Holden described in great detail the methods of preparing the various pigment pastes for application to glass plates and to textile fabrics, both on the laboratory scale and in large mixings. He carried out a series of experiments by using acetyl-cellulose as the final fixing agent. In view of the uncertain and irregular composition of the commercial product, the acetyl-cellulose used was made on the laboratory scale. By this procedure it became possible to be more certain of the actual composition of the product used and of its relative purity. As there were different stages in the acetylation of cellulose the production of a standard quality product became the subject of a considerable amount of investigation. It was found that acetyl-cellulose, when applied to samples of cotton velveteen, gave results in respect of properties of fixing prussian blue pigment much inferior to those given by the various waxes. This particular application of pigments to velveteen, and possibly other classes of textile fibres, was capable of extensive utilisation in large-scale work, and the possibilities yet open were very wide in producing a variety of styles, especially in self-shades, shot effects, embossed shot effects, notably alkaline discharge shot-effects, and printed embossed shot effects.

Singeing and Dyeing Properties of Cotton

The function of singeing cotton in the yarn state and in the woven fabric, Mr. Holden stated, was well known, but in variable circumstances, wherein this special function operated in the removal of superficial hairs or fibres from the cotton, whether adequately or inadequately, the operation was accompanied by the exertion of a measurable degree of oxidising influence on the portions of the cotton most affected during the process of singeing. The resultant effect was to impart locally a lessened affinity towards the substantive colouring matter during subsequent dyeing. When the singeing operation was conducted under properly controlled conditions with respect to temperature, having regard moreover to the simultaneous supply of atmospheric oxygen, it was possible to pre-determine the relative degree of resistance to dyeing with the direct cotton dyestuffs which would be exhibited on the surface of the cotton material so treated. Cotton velveteen was a fabric which particularly lent itself to the two-tone effect thus obtainable.

Fastness to Sulphur Dioxide

Investigating a New Dyeing Factor

AT the autumn conference of the Textile Institute held at Bury on Wednesday, October 17, a paper entitled "Considerations on the fastness to sulphur dioxide of fabric dyed with azo dyestuffs," was read by Mr. A. T. King, B.Sc., F.I.C.

Mr. King stated that the importance of a thorough understanding of the chemistry of the action of sulphur dioxide on dyed material should need no emphasis, yet this had been practically an untouched subject, apart from the practical test of whether or not a dye was altered by stoving. The fact that certain azo dyes could form compounds with sodium bisulphite, markedly different in colour from the original dye, was observed first by Spiegel, and later by Voroschtsoff. The latter showed that the reaction was confined to naphthol derivatives, which, however, included a number of popular direct and developed cotton colours as well as acid dyes. A more detailed study of this reaction in the case of the simpler azo-β-naphthol dyes had shown that sulphur dioxide alone had no action, but that after a certain proportion of alkali was added, formation of the bisulphite compound (azo sulphite) commenced, increasingly rapidly to a maximum, and then falling rapidly with further alkali addition.

Effect of Alkalinity on Azo-Dyestuffs

Thus there was an "active range" of alkalinity for such dyestuffs within which sulphur dioxide would turn them completely off-shade, though they might be quite fast to this reagent alone. As the dye was similarly affected when on fabric which contained alkali, the practical significance of the reaction was obvious. The conclusion drawn was that the use of dyes of this type, however excellent might be their fastness to stoving as claimed by the colour maker, should be confined to goods which were finished acid. On wool-dyed or yarn-dyed material the risk of going off-shade through contamination with sulphur dioxide was always present.

In view of the standard stoving test being designed to imitate commercial stoving, which was carried out on scoured and therefore alkaline material, it was at first sight surprising that such good degrees of fastness should be recorded. There were two reasons for this—firstly, with rapid neutralisation in an excess of sulphur dioxide the active range was quickly traversed, and the dye was then unaffected by further exposure. Secondly, the standard method of preparing the dyed pattern for test, by rinsing and then wringing it out of neutral soap solution, might not even neutralise the residual acid left in the wool after dyeing, let alone make the wool alkaline, and the active range was missed altogether. Thus the misleading character of the scheduled fastness to stoving, when it came to choosing a dye of good all-round resistance to sulphur dioxide, was apparent. The fastness of a dye to sulphur dioxide, hitherto a somewhat obscure factor of limited scope, promised to rival in importance its fastness to light.

Physical Society's Nineteenth Exhibition

THE nineteenth annual exhibition of electrical, optical and other physical apparatus is to be held by the Physical Society and the Optical Society on January 8, 9 and 10, 1929, at the Imperial College of Science and Technology, South Kensington. As on former occasions the Exhibition will be divided into a trade section, comprising the exhibits of manufacturing firms, and a research and experimental section. The preliminary invitation to trade exhibitors has already been issued, and entries have been asked for by October 27. Offers of exhibits should be communicated immediately, and in any case not later than November 14, to the Secretary, Physical and Optical Societies, 1, Lowther Gardens, Exhibition Road, London, S.W.7.

Chemistry in the Life of the Nation

Professor Allmand's Address at King's College

A series of lectures on "The Indebtedness of Industry to Pure Science" is being given at King's College, London. On Wednesday, as part of the series, Professor A. J. Allmand dealt with "The Rôle of Chemistry in the Life of the Nation," Dr. G. C. Clayton, M.P., in the absence of Lord Melchett, occupying the chair.

Dr. G. C. Clayton, who presided at the lecture, said there was no doubt that industry in this country in the past did not appreciate the value of chemists, and in particular chemical technologists. Nowadays, however, we had awakened to the need of their assistance in our manufactures. He thought it could be said that there was a definite shortage of really first-class chemists and engineers. A really good man need never be in want of a post. A great number could be absorbed, but they must be first-rate.

The Lecture

Chemistry, (said Professor Allmand) was that science which dealt with the change of one substance or set of substances into another substance or set of substances. Defined thus, chemistry was bounded on both sides by the science of physics, on the one hand by the older classical physics, on the other by the newer atomic physics. The boundaries were about as indistinct as they could be. The Professor of Chemistry at the Royal Institution was that distinguished physicist Sir William Bragg. Two of the Nobel Chemical Prizemen during recent years had also been distinguished physicists—Sir Ernest Rutherford and Dr. F. W. Aston. And, indeed, if a physicist were to assert that chemistry was simply an enclave in the greater science of physics he would have a very arguable case. And it was chiefly certain considerable differences in experimental technique and a divergence in point of view which was the result of history, combined with the fact that the majority of changes studied by the chemist were too complex to yield, at present, to physical analysis, that made it convenient still to distinguish between the two sciences. Further, the present inevitable urge towards specialisation made it more than likely that the distinction would continue.

Relationships of Chemistry

Chemistry also had the closest affinities with the biological sciences and with geology, particularly with the dynamic aspects of those sciences which had been so much developed during recent years. And, finally, it had extremely important connections with the greatest of the technologies, namely, engineering. The vital problem of power production had essential chemical aspects, as also had subjects such as corrosion, water purification, and even road making. Metallurgy was, in the main, a species of chemistry, practised on a large scale, and hence using the methods and appliances of chemical engineering. One of the most interesting developments in technology in recent years had been the emergence of chemical engineering as a valid subject with a recognised technique of its own.

The group of activities with which chemistry was most directly concerned was that of industry. Every separate industry required raw materials and power, and turned out products (frequently by way of intermediates or intermediate products). The products of one industry usually formed the raw materials of another; so that by the time the ultimate raw materials (naturally occurring matter of animal, vegetable or mineral origin) had been converted into ultimate products (the finished articles and commodities as finally delivered to the user or consumer), they would have passed through a whole series of industries, or, at all events, processes, in each of which some kind of a change had been effected in them. A moment's reflection on what was involved in the complete manufacture of such objects as a fountain-pen, a stainless steel table-knife, or even a tobacco pipe, or a tin of preserved food, or a lacquered brass door handle, would make this clear.

Chemical *v.* Mechanical Changes

These modifications and transformations effected in the processes of manufacture were essentially of two kinds: changes in form, brought about by mechanical means, and changes in substance, or chemical changes. Still keeping in mind the totality of the processes involving transformation of ultimate raw material into ultimate products, they would find that chemical changes preponderated in the earlier stages of manufacture, whilst the mechanic and artificer and factory hand were chiefly responsible for the later stages. Chemical industry was at the basis, then, of a vast number of other industries, in that it furnished many of the raw materials on which the latter depended.

Still considering the whole sequence from ultimate raw materials to ultimate products, industrial chemistry was responsible for a great number of the intermediates. Indeed, it was for this reason that, inclusive of metallurgy, that it might well lay claim to be considered the most fundamental of all industries; and not so much so on account of its products which were directly used, as such, by the individual citizen, important as some of them (soap, explosives, synthetic drugs, and so forth) might be. It was very rarely indeed that ultimate raw materials were employed for their final purpose without some sort of preliminary chemical modification. Stone, slate and wood used for building purposes were, perhaps, the most marked cases of the kind, and even here the aid of the chemist was being sought, ever more and more, to prevent their deterioration.

Chemistry and Energy

The other universal need of industry was power or energy. Our present crowded populations could not exist were it not for plentiful supplies of food, raw materials and power. On the whole, the raw materials existed, and the food could be produced, but by no means always in the immediate neighbourhood of the dense population areas; and that the latter were maintained and even tended to increase was due essentially to an intensive exploitation of the use of power in transport and in industry. Only in that way could food and raw material be brought in sufficient quantities to the manufacturing centres, and only in that way can the space-time yield, as it was termed, of industry be kept at the level required to maintain the present standard of living.

The industries then which were engaged in the production of food, necessary to life, and of power, necessary to our present mode of life, could fairly be regarded as fundamental. Professor Allmand, dealing with the part played by the chemist in the production of food, dealt with synthetic fertilisers; the beet sugar industry; the hardening of fats; the production of vitamins; and, finally, note must be made of the work of the chemist in detecting and preventing the adulteration of food. With regard to power, Great Britain depended largely on her coal. The chemical properties of coal were now the subject of much systematic research. Modern methods of transport depended largely on the internal combustion engine, which required liquid fuels. At present these were imported, but already, at the Fuel Research Station and the Billingham works of the Imperial Chemical Industries, Ltd., results of importance in regard to the conversion of coal to oil by hydrogenation were being obtained. In Germany, where this work was begun by Bergius a good many years ago, a certain plant (protected by an import duty) was making about 60 tons per day of light fuel oil or motor spirit from lignite. Professor Allmand also touched on the search which was being made for a smokeless solid fuel, and on the creation of the artificial silk industry, mentioning that Mr. C. F. Cross, F.R.S., whose work on cellulose had laid the foundation of the latter, was a former student of King's College.

Chemistry, even if logically a part of physics, was, in practice, a separate science of enormous scope. And it claimed to be the fundamental science for our present material civilisation precisely because it was chemical technology which had first access to the world's natural resources. On the chemist then rested an enormous responsibility—that of conservation and of the prevention of material waste in its widest sense. His past experience fitted him for this task. He had been accustomed to eliminate or to reduce to a minimum useless by-products in his factory; he must now do the same thing on a larger scale in his rôle of chief technical adviser on the economic disposal of the world's resources.

Acid Elevators and Pumps

Second Lecture at Sir John Cass Institute

THE second of the series of lectures on chemical plant at the Sir John Cass Technical Institute, London, on "Acid Elevators and Pumps, and Fans for Acid Gases," was delivered on Tuesday evening by Mr. E. A. Reavell, B.Sc., A.R.C.S., A.I.C.

The lecturer traced the development of the various methods of handling acid in bulk, starting with the primitive acid egg and finishing with the modern glandless acid pump. Particular attention was given to the handling of sulphuric acid, in view of its paramount commercial importance. The numerous disadvantages of the hand-operated acid eggs were pointed out, and it was shown how these difficulties had been overcome in the Kestner automatic elevator. These are now made in two general types, the one giving a periodic discharge and the other a continuous discharge for feeding acid sprays, filter presses, etc.

However satisfactory an elevator might be, its efficiency was limited to that of the principle of acid raising by means of compressed air. Taking, as an example, the raising of 1·75 specific gravity acid a height of 60 ft., and working on purely theoretical considerations, without allowing for actual working efficiencies, the work done in compressing the necessary air was 2¼ times the actual work done in raising the acid. On this account, the plunger pump was now replacing the elevator.

Plunger Pumps

The difficulties of making a satisfactory plunger pump for acid were discussed, particular reference being made to troubles with glands and gland packing, and it was shown how these difficulties were overcome in the Kestner patent glandless plunger pump. This pump has a mechanical efficiency of 80 per cent., and is made in various types suitable for strong and weak sulphuric and nitric acids.

The problem of raising 1,750 gallons per hour of 1·8 specific gravity acid a height of 80 ft. was worked out. With a compressed air system, this duty required 44 cu. ft. per minute of free air compressed to 94 lb. per sq. inch taking 8·2 b.h.p. on a two stage compressor having an efficiency of 80 per cent. On the other hand, a plunger pump for the same duty would take only 1·75 b.h.p., or 6·45 b.h.p. = 4·8 k.w. less than the compressor. Allowing 70 per cent. efficiency for the electric system, the pump would save over £200 per year with electricity at 1d. per unit.

Other Glandless Acid Pumps

The lecturer then went on to the consideration of other forms of glandless acid pumps, namely, the Kestner horizontal and vertical centrifugal pumps. The former embodied the same glandless principle as the plunger pumps, namely, the continuous leakage of a very small proportion of the acid between a silicon-iron sleeve and a silicon-iron plunger in the case of plunger pumps, or between silicon-iron rotors and stators in the case of centrifugal pumps. This leakage lubricated the working parts and was automatically returned to the pump suction. Depending on conditions, there was a limiting strength of acid below which this glandless principle could not be employed for sulphuric acid; hence the development of the vertical glandless centrifugal pump for weak sulphuric and other acids.

In this design, the impeller spindle was mounted vertically in ball bearings which were entirely out of contact with the acid. Thus, there were no bearing surfaces whatsoever in contact with acid, and the application of the pump was limited only by the mechanical features of the constructional materials available for various acids.

Fans

Finally, the well-known Kestner low and high pressure fans, as used for handling sulphur dioxide gases in sulphuric acid plant under various conditions, were described. Mention was made of the lead contact fans for chamber plant, cast iron fans for draughting furnaces, and high pressure fans for acid concentrators, and the method of balancing the impellers was dealt with. In conclusion, the lecturer referred to special constructions, such as earthenware and ebonite, for chlorine and similar gases. The lecture was illustrated by a number of slides showing photos and sections of various types of elevators, pumps and fans.

Essex Factory Explosion

Inquest on Five Victims

THE inquest was held on Thursday, October 18, on the five victims of the explosion which occurred on Monday, October 15, at the factory of Explosives and Chemical Products, Ltd., at Bramble Island, an isolated spot on the marshes between Clacton-on-Sea and Harwich. The victims were Richard Cockayne (works' chemist); Robert Pither; John Sallows; Mary Jane Claydon; and Lilian Maud Lambert. The Coroner (Dr. Harrison) said the five victims were all blown to pieces, and in each case death appeared to have been instantaneous. An official inquiry would be carried on until the cause of the explosion was ascertained as far as possible.

The Evidence

Mr. Samuel Baldwin, the manager of the factory, said that the company was licensed by the Home Office for the manufacture of high explosives of all kinds, and since its foundation in 1905 there had been only one explosion, in 1913. During the war it was a controlled establishment, and since then it had been employed in making many explosives. At 8.42 a.m. on Monday, October 15, he heard an explosion. Work was at once stopped, all the employees were sent to the mess-room and measures taken to ensure safety. He had no wish to hide anything from the jury. Immediately after the explosion he informed the Home Office.

Frank Henry Wheeler, of Lime Terrace, Dovercourt, the chemist-in-charge, said that Cockayne served under him, and it was his duty to visit the mixing house. He was unable to identify the bodies of Miss Claydon and Pither, but he identified Miss Lambert by her hair and Cockayne and Sallows by their clothing.

Inspector J. F. Box said that he visited the scene of the explosion and found a crater about 15 ft. deep. The earth was piled 15 ft. high. He found parts of bodies 50 to 70 yds. away, and pieces of machinery 400 yards away.

Home Office Inquiry to be Held

Dr. H. E. Watts, Explosives Inspector, Home Office, said that the Secretary of State had ordered an inquiry to be held under section 66 of the Explosives Act, and he would hold that inquiry into the cause of the accident. In this building there were two types of machines, and explosions had occurred with one type of machine which was in this building previously. One occurred in 1914 and another in 1915, but since that time they had had no further explosions with that type of machine. He was making inquiries, but at present could not say what was the direct cause of the explosion. There was no evidence to go on. There were only two substances in the building, and one was more sensitive than the other. One's attention was naturally drawn to the more sensitive explosive. Attention was also drawn to a moving machine. They must have a machine, and that, coupled with the human element, was a thing which must be taken into consideration. So far as his inquiries went, there had been no breach of the terms of the Home Office licence, so that there was no question of blame in this case. A special report would be drafted giving the result of his inquiries. The factory was inspected by one of the Inspectors of Explosives in July last, when everything was found to be in order. Inspectors regularly inspected these factories, and they were all surprise visits, so the jury could clear their minds of certain statements that had appeared.

The Coroner referred to a previous explosion in 1913, the cause of which, he said, was the use of hollow tubes. He understood that those things had been scrapped after the explosion.

Dr. Watts.—There are no more like it.

A juror.—Are these machines foolproof; does it need intelligence to use them?

Dr. Watts.—They need a certain amount of care; there is the danger that when one gets used to them one uses less care, but I do not say that is what happened in this case.

The Coroner said that that was all the evidence he proposed to take, and he would leave the matter with the Explosives Department, who would make every effort to find out the cause of the explosion.

The jury returned a verdict of "Accidental death" in all five cases.

Health Hazards in Chromium Plating

An Important American Investigation

A PAPER on health hazards in chromium plating, by J. J. Bloomfield, of the Public Health Service, and W. Blum, of the Bureau of Standards, was presented at a recent meeting of the American Chemical Society. This paper has now been published in United States *Public Health Reports* for September 7, 1928, and reprints may be obtained from either the U.S. Public Health Service or the Bureau of Standards, Washington, D.C. A brief résumé of this paper is as follows:

During the past few years chromium plating has developed rapidly, and it is now being extensively applied upon automobiles and plumbing fixtures because of its high lustre and resistance to tarnish; and upon printing plates, gauges, tools and dies on account of its extreme hardness. The bath used for chromium plating consists principally of chromic acid. During the plating process considerable hydrogen and oxygen are liberated, and these carry a spray of chromic acid into the air.

Known Dangers of Chromium Compounds

It has long been known that in the manufacture of chromic acid and chromates, the operators are subject to attack and perforation of the nasal septum; and to the formation of ulcers or "chrome holes" upon the hands or other exposed parts of the body. Accordingly some provisions have been made in all chromium plating plants for artificial ventilation and for other sanitary measures. In spite of these precautions, however, the employees in some plants in the United States have been affected in the above mentioned ways.

In order, therefore, to determine the extent of the hazard and the best means of overcoming it, a survey was conducted in several commercial plants. This included a study of the methods and degree of ventilation of the concentrations of chromic acid in the air breathed by the workers, and a physical examination of the latter. Although only six plants were visited, and twenty-three persons examined, the results were so consistent in different plants, and agreed so well with previous experience with chromates, that certain tentative conclusions and recommendations are warranted.

Results of Examination of Plating Plants

It was found that exposure to very low concentrations of chromic acid, *e.g.*, one milligram in 10 cubic metres, or one-sixtieth of a grain in 350 cu. ft. (which is about the volume of air breathed by a worker in eight hours), is sufficient to cause nose bleeding and nasal inflammation in a week or less. Higher concentrations or longer exposures cause extensive attack and even complete perforation of the nasal septum. This is painless, however, and the operator may be entirely unaware of the perforation. Many of the employees were found to have chromium ulcers on the hands or other exposed parts of the body. No evidence was found of injury to the respiratory tract except in the nose, nor of any effect upon the digestive system or the kidneys.

While, therefore, there is a real hazard in chromium plating, it is not critical, and can be entirely eliminated by suitable measures. These should include an effective system of ventilation in which the air is drawn horizontally across the plating tanks into a narrow duct in which the air velocity should be about 2,000 feet per minute. So far as possible rubber gloves, aprons, and shoes should be worn. Frequent applications of vaseline or mentholatum salve to the nose and hands greatly reduce the danger of ulceration. All cuts and abrasions of the skin should receive regular inspection and medical treatment.

If these simple, entirely practicable measures are taken, the hazard can be practically eliminated There is no reason (say the American investigators) to fear, therefore, any serious injuries from the extension of chromium plating that is likely to occur in the next few years.

Possible Spanish Duties on Fertilisers

IT is stated that the imposition of heavy duties on superphosphates, nitrate, and sulphate of ammonia coming into Spain has been proposed. The object of such action, if taken, would be to encourage the production of fertilisers in Spain itself. British imports of ammonium sulphate into Spain amount to many thousands of tons per year.

Static Sparks from Band Conveyors

A Method of Prevention

OBSERVATIONS on band conveyors at work lead to the presumption of the presence of static electricity, such as is noticed on high-speed fan belts. The phenomenon is particularly noticeable in dry weather; rubber-cotton conveyor belts would appear to be most susceptible. If the presence of static electricity constitutes a danger, as in dusty atmospheres, or in explosive factories, where a spark might cause an explosion, the subject becomes one of great importance to handling engineers.

Opinions differ as to the part of a band conveyor at which the electricity is produced, but since the electricity is probably created by a band of some non-conducting material passing rapidly through the air, the source appears to be at some point between the terminals, rather than at the terminals. Even so, if the terminals are of metal, the current created will be led to earth. On the other hand, the idler supports, which are generally also of iron, would take care of such current at points between the terminals. Notwithstanding such arguments the presence of static electricity is often noticeable during dry weather.

Mr. W. F. Schaphorst, in a letter to *Power*, has described some investigations, the outcome of which is the application of a mixture of glycerine and water to a belt a few times a year. He suggests a rubber-cotton belt, provided between the plies with a loosely-woven wide-mesh wire cloth. A comb-shaped metal plate with an earth connection which will pick off any static electricity from the bands at a number of points can also be recommended as an additional safeguard.

Commercial Gas Conference at York

THE seventeenth annual conference of the British Commercial Gas Association was held at York on Monday, Tuesday, and Wednesday this week. The general subject for discussion was the relation of modern industry and mass production to art and beauty, which theme was treated at length by Mr. Alfred Procter in his presidential address on Tuesday. Before the Industrial Revolution, industrialism, he said, had not involved mechanisation, but with the coming of machinery came great ugliness. The great danger with our modern mass-produced goods was that we were apt to suffer by the loss of that pride lavished by the craftsman of old on his work. It was vitally necessary to retain this pride in our creations. With regard to smoke, he thought he might say that Scotland and the northern counties were showing a remarkable example to the rest of the kingdom by their enterprise in dealing with the domestic smoke problem. The Regional Smoke Abatement Committee of the West Riding had recently invited the hundred local authorities affiliated to it to forward information showing precisely what had been done in their respective areas.

Among those who addressed the conference were Sir Lawerence Weaver, on "Art in Industry," Sir W. Arbuthnot Lane, on "The Gas Industry in Relation to the Health of the People," and Mr. Ernest Hunt on "Business—Ancient and Modern."

Another Industries Fair Record

BOOKINGS of stand space in the London Section of the British Industries Fair, to be held at the White City from February 18 to March 1, have exceeded the record figure of 257,000 square feet at the last Fair. This means that both the London and Birmingham sections will be larger than ever before, the Birmingham bookings having exceeded the previous figures some time ago. The space booked in the two sections by the Dominions and Colonies for the display of raw materials and manufactured products is more than double that occupied last February. Copies of the film taken at the last British Industries Fair, in which the King and Queen are the leading figures, have now been despatched by the Department of Overseas Trade, for exhibition before the opening of the next Fair, to Australia, New Zealand, Canada, Sweden, Italy, Turkey, Belgium, Switzerland, Portugal, Dutch East Indies, Colombia and Portuguese East Africa. The film is also available now for exhibition at home.

German's Claim Against Merchants

The Privacy of Accounts

At a sitting of the Anglo-German Mixed Arbitral Tribunal on Friday, October 19, the Court, comprising Baron Van Heeckeren (president), Dr. Heber Hart, K.C (British member) and Dr. Zacharias (German member) there was mentioned the claim by a German national named Carl Krientz against the London firm of Charles Page and Co., of King William Street, who carry on an export trade in chemicals.

Counsel appearing for the respondents said that the latter considered that it would be detrimental to their interests for the books containing full information regarding their supplies to go out of the country, and perhaps get into the hands of enemies. He was instructed to press the court so far as he could, to reconsider the Order it recently made, and respectfully to submit that a firm of chartered accountants in this country might be nominated by the German Government to have access to the books here.

In answer to observations by the President, Counsel said he was at liberty to explain that the books contained, with other matters, the names of all debtors of the English company in regard to coal tar products, and also of all buyers who traded with them to-day.

Dr. Behl, the representative of the German Government, pleaded that as Mr. Krientz had been a manager in Germany for the respondents there were no secrets in the books for him. He considered that it was the respondents' obligation to deliver full accounts to the claimant under what they regarded as the contractual claim in respect of commission, etc. What had already been delivered he contended had not been satisfactory in any way, because of lack of details. It might, however, be possible for the claimant himself to come to London for the purpose of inspecting such books, if the respondents would agree to pay the exceptional costs involved.

After further discussion the respondents agreed to Dr. Behl's proposal.

Voluntary Liquidation of Manufacturing Chemists

In pursuance of the provisions of the Companies Consolidation Act, 1908, a meeting of the creditors in the voluntary liquidation of Vanore, Ltd., manufacturing chemists, of 4/6, Muswell Hill Road, London, N.6, was held on Monday at the offices of Haynes and Baker, accountants, Mortimer Hall, Mortimer Street, W., when the liquidator, Mr. W. F. Baker, reported that the liabilities to trade creditors amounted to £704 17s. 5d., whilst there were debentures and interest totalling £731 1s. 4d. In addition, there were loan creditors for £225, whilst there was an amount of £1,467 due to Mr. B. C. Fisher, managing director of the company, under an agreement. According to the balance sheet the assets were as follows :—patents, goodwill and trade marks, £393 19s. 6d. ; furniture and fittings, £18 3s. 7d. ; plant, £78 3s. 6d. ; sundry debtors, £500 9s. 1d. ; stock, £200 ; and a motor car, £41. Mr. Baker stated that they were book figures, and if it came to a realisation it was very doubtful whether the trade creditors would receive any dividend at all. The company was formed in 1921 with a nominal capital of £100 divided into one hundred shares of £1 each. It commenced business in May, 1923, with Mr. B. C. Fisher as the managing director. According to the trading accounts, purchases in the first year were £3,107, whilst the sales totalled £5,625. There was a gross profit returned of £2,981, and the expenses had been £3,036, the principal item being salaries and expenses of travellers, £1,140. In the following year, the purchases were £1,577 and the sales were £5,002. There was a gross profit of £3,134, but after deducting expenses a loss was returned. For the year to April 30, 1926, the purchases were £2,543 and the sales increased to £7,848. The gross profit was £4,577. Mr. Baker added that he had got out an account as from May 1, 1926, to October 3, 1928, which disclosed purchases of £3,158 and sales of £10,865. There was a gross profit of £6,676. In reply to a creditor, Mr. Baker said that he had been appointed receiver on behalf of the debenture holder, Mrs. Fisher, and acting in that capacity he had cut down the expenses and was endeavouring to carry on the business profitably, so that the creditors might receive some dividend. It was decided to confirm the voluntary liquidation of the company with Mr. Baker as liquidator.

Speedy Protection Against Fires

Probably a large number of factory fires gain ground at their commencement because the extinguishers used on them are not sufficiently speedy in action, or because of a lack of familiarity on the part of the workmen using them.

The ideal fire extinguisher would be really portable, and its method of operation would be so simple as to be obvious, while it would be able to deal with an average outbreak in the shortest time and finally, and perhaps most important of all, its contents should be capable of no harm to anything at all except fire. Antifyre (Sales), Ltd., of London, have placed on the market an extinguisher which appears to come very near the ideal. The "Pistole" is extremely simple in construction, and as is indicated by its name, is similar to a revolver, having a detachable container which fits into a butt handle. The operation is simple, a crossbar is drawn, and the machine aimed and "fired" in the same manner as a revolver. Two seconds is stated to be the average time in which a fire is extinguished, the agent being a cloud of fine powder, which may be projected about 20 ft. The dust is harmless to the most delicate materials, is non-corrosive, and is not messy, as are some liquids in use. One of the advantages of this type of extinguisher is that 24 refills only weigh as much as one liquid apparatus. Antifiyre (Sales), Ltd., however, make a foam apparatus and also a soda-acid filled apparatus as well, so that their range of fire fighting plant provides for all possible kinds of fire which may need attention.

Statutory Meeting of Waste Food Products

A prosperous future was forecast for Waste Food Products, Ltd., at the statutory meeting in London, on Wednesday, October 17. Mr. D. B. W. Markham said that the company had started off with two very fine contracts, one with Lyons and the other with the A.B.C., both for five years with an option to renew for another five years. The contracts which they had made for the supplies of raw material came in so quickly that they had immediately to consider the erection of further units of plants. When their first big unit commenced operation they would be dealing with 100 tons a day. By February they would have a second unit treating a minimum of 82 tons a day. Dealing with the foreign patents, the chairman said that in order to protect their name they had registered seven companies. W. Weddel and Co., Ltd., of Union Cold Storage, had contracted to take the whole of the company's feeding meals and edible fats. Mr. John Lewis (managing director) said it had always been his idea to conduct the business so that their material should be handled by the most hygienic methods. His object was to turn out a product superior to anything that had been produced either in this country or elsewhere. The ordinary feeding meal made to-day had too much fat in it, and as fat was much more valuable than the meal they took it out, and, incidentally, received a higher price for their meal after taking out the excess fat. The chairman having replied to questions, the proceedings terminated.

A Paper on Boiler House Instruments

In a paper read before the Junior Institution of Engineers on Friday, October 12, Mr. F. Squirrell expressed his views on the "Use of Boiler House Instruments." His remarks were confined mainly to suggestions as to where instruments should be used and what should govern their choice. The measurements dealt with were quantity of steam, coal and water ; analyses of flue gas, temperature, draught and water level, but accessories for such plant as water softeners and deaerators were purposely excluded. He recommended the provision of instruments in the following order, going as far in the list as funds permitted ; a CO_2 indicator for each boiler, recording mechanism if possible ; a portable index thermometer about 4 ft. long with 4 in. dial reading up to 800° F. for common use ; a simple form of draught gauge to each boiler, with several different connections ; a steam meter to each boiler or a common water meter ; coal measuring arrangements.

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The Chemistry of Proteins

Professor Schryver's Lecture

BEFORE a large audience comprising members of the Biochemical Society of the University of Birmingham, Professor S. B. Schryver, of London University, on Wednesday, October 17, delivered a lecture at Birmingham University on "The Chemistry of the Proteins." Professor A. R. Ling occupied the chair. Professor Schryver said that the cardinal food materials for the lower animals and mankind (excluding mineral matters) were, speaking in general terms, the proteins, the carbohydrates and the fats. No one of these classes was indispensable, but the proteins were *facile princeps* body builders. The single members of the class typified by egg-white were of an extremely complex character, and it was to their breaking down and reassembling in other forms (still retaining the characteristics of the class) in the animal body that their nutrient value depended. Protoplasm, which Huxley described as the physical basis of life, consisted largely of proteins associated with other substances.

Professor Schryver's lecture was principally concerned in studying the products of the breakdown of the protein molecule into the bricks of which it was composed, it being known that the specific value of different proteins to the animal was conditioned by the character of its constituent bricks. The lecturer commenced with an account of the work of the late Professor Emil Fischer, whose methods for isolating and identifying the products resulting from the breakdown of the proteins he described. Fischer, in the course of his researches, isolated several amino-acids and basic substances from specific proteins. His methods, ingenious as they were, left much to be desired because of the difficulty of carrying them out, and also of the risk of the occurrence of secondary change. Professor Schryver has, during the past seven years devised new methods, and by these methods has isolated several new amino-acids. The lecture consisted, for the most part, of an account of unpublished work.

Lining Hydrochloric Acid Tanks

ONE of the most urgent needs of the chemical industry is a constructional or reinforcing material that will withstand the action of hydrochloric acid when concentrated and hot. After much experiment it has been found that it is possible to produce a soft compound which neither contracts nor expands over quite a wide range of temperature, which has a high resistance to corrosion, and which can be applied in an unvulcanised condition, being moulded into shape with the application of heat. This new material, made by the St. Helens Cable and Rubber Co., Ltd., of Slough, under the name of "Cabtyrit," is derived from "Cabtyre," the well-known electrical insulator which is greatly in use in acid-laden atmospheres. "Cabtyrit" is a dense compound of specific gravity 1.0. It softens and becomes plastic at about 25° C., and can be worked and moulded into shape. "Cabtyrit" resists the action of hydrochloric acid and its solutions at all strengths and temperatures up to 110° C., for which purpose indeed it was specially evolved. It has also been found to withstand the action of most organic acids, such as tartaric, citric, lactic, malic, and formic acids, and also of phosphoric acid and of cold sulphuric acid up to 80 per cent., and of hot vitriol at strengths not exceeding 60 per cent. It is not recommended for nitric acid, though weak solutions of nitric acid do not affect the new material. Solutions of "Cabtyrit" can be applied as paints and sprays to iron surfaces, and thus forms a convenient paint for the internal surfaces of large water and weak-acid liquor tanks. Being a heavy compound, "Cabtyrit" can be vulcanised in a crude manner, which enables intelligent labour to fashion pipes and fittings with the plant usually found in an ordinary works.

Annual Dinner of Lubricating Federation

THE ANNUAL DINNER of the National Lubricating Oil and Grease Federation was held in London on Wednesday, October 17. Sir Robert Whaley Cohen, replying to the toast of the Federation, said that the motor had shifted the centre of interest from illuminating oil to petrol, and he would not be surprised to see another revolution in the near future when the Diesel engine came into general use. Mr. Harold Moore and Dr. A. E. Dunstan were among those present.

Details of the Nickel Merger

A STATEMENT has appeared (though on inquiry at the offices of the Mond Nickel Co., the secretary declined to confirm it) with regard to the terms said to have been made for the fusion of the Mond Nickel Co. and the International Nickel Co. (the latter having its head office at New Jersey). It is said that the shareholders will receive an offer to exchange their shares for shares in a holding company. The Mond Nickel preference shares will receive an equal number of 7 per cent. cumulative preference in the new company. Each 10s. ordinary share of Mond Nickel will receive an ordinary share in the new holding company, while each International Nickel share will receive six new ordinary shares. Owing to the larger number of preference shares of Mond Nickel, the proportion of earnings in the new company will be 4½ to 1 in favour of the International Nickel Co. The Mond Nickel Co. will maintain its separate entity and board, with possible additions representing the combine. The mines of the above two companies in the Sudbury district of Ontario produce about 90 per cent. of the world's production of nickel. One report states that the majority of the directors of the International Nickel Co. will be Canadians, and the company will probably have a Canadian charter to avoid the Sherman Anti-Trust Law. During the first half of 1928 Canada produced 46,463,107 lb. of nickel worth $10,625,702, as compared with the corresponding 1927 total of 34,781,199 lb. valued at $8,008,823, an increase of 33·6 per cent. in quantity and of 32·7 per cent. in value. The total production was made up of 19,589,969 lb. of nickel in matte and speiss exported; 21,955,829 lb. representing refined and electrolytic nickel produced in Canada; and 4,917,309 lb. of nickel in oxides and salts sold. Exports of nickel in August reached 8,007,200 lb. compared with 3,268,300 lb. in the previous year. Up to the time of going to press no official confirmation of the merger could be obtained.

Action of Metals on Dyestuffs

A JOINT meeting of the Society of Chemical Industry and of the Dyers and Colourists, Mr. H. Boyce Mayfield presiding, was held on Wednesday, October 17, at Nottingham. Mr. J. C. Grundy presented a paper on the action of metals on dyestuffs. The effect of dyeing goods with various classes of dyestuffs was investigated in vats of wrought iron, cast iron, copper, nickel, monel, lead, Firth staybrite, Firth stainless steel, dyebrite, silverite, phosphor bronze and brass. Compared with the effects obtained in enamel, the irons gave duller or paler shades in almost every class of dye. The other metals gave good results with direct (diazo fast and rosanthrene) basic, vat and azoic colours, while copper and its alloys were detrimental to the sulphur colours. Nickel, brass, Firth staybrite, dyebrite, and silverite gave standard results with over 80 per cent. of the numerous acid colours investigated. The other metals gave more variable effects with individual dyes of this group and the cloth fast, neolan, chrome fast, direct, and chlorantine fast groups. The lecture was illustrated by pieces dyed under the various conditions, and by lantern slides.

Brazilian Nitrogen Fixation Plant

THE time limit for the presentation of bids for the construction of a nitrogen fixation plant in Sao Paulo expired on May 27, and the Secretary of Agriculture announced that only one bid was received, from the Cia Hydro-Electrica de Adubos Chimicos e Alkalis, whose proposal was prepared by F. J. Crowley and Partners, London.

General surprise was caused, states the *American Fertilizer*, by the fact that no proposal was presented by a group of British financiers who were said to be responsible for the two postponements in the time for presenting bids. These postponements were of 30 days and 60 days, and were supposedly motivated by important British interests. A British mission made a thorough study of the situation and according to reports they decided that the market was too small to warrant the installation of a fixation plant. It has been said that the British group advised the Government not to proceed with their plans, and endeavoured to prove that it would be cheaper for the farmers to purchase imported fertilisers.

Graphite in the United States

NATURAL graphite is used chiefly in the manufacture of foundry facings, pigments and paints, crucibles, pencils, commutator brushes, stove polish, lubricants, retorts, and batteries. During the last few years the use of graphite in the United States has undergone radical changes. Uses that a few years ago consumed a large proportion of the supply are now relatively of minor importance, and uses which were unimportant have become important. Before the war the manufacture of graphite crucibles consumed more than one-half of the supply; in 1923 only 15 per cent. of the graphite used in the manufacture of finished products was used in the manufacture of crucibles, and in 1924 only 13 per cent. Foundry facings used only 10 per cent. of the graphite in 1913; the quantity so used in 1923 was 44 per cent., and in 1924 it was 52 per cent. Other uses that were minor before the war and are now of much importance are in pigments and paints, pencils and crayons, commutator brushes, stove polish, and lubricants. Graphite is manufactured at Niagara Falls, N.Y. This branch of the industry was started in 1897, under patents obtained by Dr. E. G. Acheson, and was developed so rapidly that after 10 years the production of artificial graphite exceeded that of natural crystalline graphite. Since 1910, except for 1915 and 1920, the output of manufactured graphite has exceeded annually the combined output of domestic amorphous and crystalline graphite. Statistical information in regard to the production of graphite in 1927 is given in a paper recently issued by the United States Bureau of Mines, copies of which may be obtained from the Superintendent of Documents, Government Printing Office, Washington, D.C., at a price of 5 cents.

Protecting Foundations Against Acid Attack

WHILE the ordinary concrete floor is long-lived and wear-resisting in most types of factory, it is readily susceptible to chemical attack and disintegration when used in places where there is constant exposure to acid. Thus the foundations of a building may also be attacked in time. A type of flooring is needed which can resist unavoidable spilling of acid and can also withstand heavy loads and hard wear. Such properties are claimed for Prodorite, a compound for flooring which has remarkable resistance to acid attack. It has, according to a National Physics Laboratory report, a crushing strength of 6,000 lb. per sq. inch, and possesses a resistance to abrasion double that of matured 2:1 sand-Portland cement concrete. At 60° C. the material is stated to withstand concentrated hydrochloric acid, 65 per cent. sulphuric acid, and 15 per cent. nitric acid. It also resists the above acids in the cold at greater concentration. A Prodorite floor is composed of precast slabs bedded in Prodorite compound, the whole being supported on a concrete base. It may be used immediately after laying. Among users of this material are manufacturers of chemicals, dyes, artificial silk, margarine, cider and spirits, tanneries, breweries, galvanisers, laboratories, sewage undertakings and dairies, a range wide enough to show the many uses to which this type of flooring may be put.

Exhibition of Apparatus at the Institute of Chemistry

ON Wednesday, at the Institute of Chemistry, Russell Square, London, an exhibition of apparatus, chemicals, etc., was held, under the auspices of the London and South-Eastern Counties Section. The exhibits included numerous products of various firms, as well as apparatus developed by various members, among others a continuous extractor (by D. Henville, F.I.C.); a laboratory apparatus for bringing a gas into intimate contact with a small quantity of liquid, and gas scrubbers (by C. H. Foott, M.Sc., D.I.C., F.I.C.); arsenic determination apparatus (by the Government Laboratory); electrometric titration apparatus for determination in an apparatus of hydrogen with Bovey potentiometer, and apparatus for tapping and wearing tests on linoleum, tiles, etc. (by the laboratories of J. Lyons and Co.); modification of Bingham plasmometer for measurement of static rigidity and plasticity of soils and clay pastes (by G. W. Scott-Blair, M.A., A.I.C.); new types of pipette, metal glass joints (by H. N. Ridyard, B.Sc., A.I.C.); an electric heater (by J. G. A. Rhodin, F.I.C.); and gas analysis apparatus (by H. D. Murray, B.A., A.I.C.).

"C.A." Queries

We receive so many inquiries from readers as to technical, industrial, and other points, that we have decided to make a selection for publication. In cases where the answers are of general interest, they will be published; in others, the answers will simply be passed on to the inquirers. Readers are invited to supply information on the subjects of the queries :—

117. (*Tank Linings.*)—An inquirer is anxious to get into touch with manufacturers of some material suitable for lining reinforced concrete tanks that will make them impervious to the action of 50 per cent. sugar solution.

Canadian Fuel Research Reports

THE Mines Branch of the Canadian Dominion Department of Mines has just issued Report No. 689, containing details of investigations on fuels and fuel testing carried on at the Research Laboratories in Ottawa during the year 1926. The report opens with a general review of investigations by B. F. Haanel and R. F. Gilmour, and in Part I. are bound up the following reports on investigations into coal, coke and peat :—" Instructions for burning coal, coke and peat," by E. S. Malloch and C. E. Baltzer; " Low-temperature carbonisation—Continuation of tests on Canadian bituminous coals," by R. A. Strong; " A study of the nature of sulphur in Canadian coal and coke," by J. H. H. Nicholls; " Air-drying of Canadian lignite, and the re-absorption of moisture by the same," by J. H. H. Nicholls; " Analyses of solid fuels," compiled by J. H. H. Nicholls. Part II. contains particulars of investigations into oil fuels, as follows :—" Gasoline survey for 1926," by P. V. Rosewarne and A. F. Gill; " Report of experiments on the dehydration of bitumen emulsion from Alberta bituminous sands," by P. V. Rosewarne and G. P. Connell; " Oil Shale from Rosevale, New Brunswick," by A. A. Swinnerton; " Report on the Pritchard process for the distillation of oil shale," by R. E. Gilmore and A. A. Swinnerton; " Canadian shale oil, and bitumen from bituminous sands, as sources of gasoline and fuel oil, by pressure crackings," by R. E. Gilmour, P. V. Rosewarne and A. A. Swinnerton. Copies of the report may be obtained by persons interested on application either to the Department of Mines at Ottawa, or to the office of the High Commissioner for Canada, The Canadian Building, Trafalgar Square, London, S.W.1.

Lime Production in Canada

ACCORDING to finally revised statistics, just issued by the Dominion Bureau of Statistics at Ottawa, the production of lime in Canada established a new record in 1927, advancing 7·5 per cent. in quantity and 3·8 per cent. in value over the 1926 production. The 1927 shipments amounted to 12,707,221 bushels, valued at $3,923,388, as against 11,825,736 bushels, at $3,781,484. Canadian producers received an average of 28·9 cents per bushel for quicklime and $11·81 per ton for hydrated lime. Lime producers reported shipments of 1,428,188 bushels of quicklime and 37,817 tone of hydrated lime to the building trades; 3,726,114 bushels of quicklime to chemical works; 2,536,096 bushels of quicklime and 6,457 tons of hydrated lime to pulp and paper works. Lime importations into Canada increased 49·5 per cent. in 1927 to a total of 165,243 bushels, valued at $70,075. Exports were recorded at 601,974 bushels, appraised at $367,939.

Institute of Chemistry Examination Passes

THE following have passed the September examination for the associateship of the Institute of Chemistry; General Chemistry, Miss J. Davis, B.Sc., King's College, London; Mr. C. H. Evans, Technical College, Leeds; Mr. G. W. Ferguson, Sir John Cass Technical Institute and Birkbeck College; Mr. V. G. Ford, B.Sc., West Ham Municipal College; Mr. Sidney Hart, A.M.C.T., Manchester College of Technology; Mr. R. H. Jones, University College and Technical College, Cardiff; Mr. W. M. Keightley, University College, Nottingham; Mr. J. A. Lauwerys, B.Sc., Municipal College, Bournemouth; Mineral Chemistry, Mr. A. Wood, Heriot-Watt College and Chelsea Polytechnic; Chemical Technology, Mr. A. D. Pulsford, Battersea Polytechnic. The following passes for the fellowship are also announced: Chemistry of Food and Water, Mr. H. Firth, Mr. A. O. Jones, Mr. R. H. Klein, Mr. D. T. Lucke; Industrial Chemistry, Mr. R. J. Munro.

From Week to Week

SIR MAX MUSPRATT has been confined to bed with a severe chill.

SIR JOSIAH AND LADY STAMP celebrated their silver wedding on Thursday, October 17.

LEVER BROTHERS, LTD., are to erect a factory at Warsaw, and building operations will commence next spring.

THE EMPLOYEES of the United Alkali Co., Ltd., St. Rollox Chemical Works, Glasgow, have contributed a sum of over £68 to charities.

LORD WEIR of Eastwood returned from the United States on Tuesday after a business trip in connection with the nickel amalgamation.

AN OUTBREAK OF FIRE occurred early on Thursday, October 18, at the Muspratt No. 2 works of Imperial Chemical Industries, Ltd., at Widnes.

DR. P. S. LEWIS, research chemist at the National Smelting Co., Avonmouth, Bristol, was married on Saturday, October 20, to Miss M. Garner.

THE PRELIMINARY REPORT, No. 14, of the Irish Free State Census of Production dealing with chemical drug and paint industry is reviewed in this week's *Board of Trade Journal*.

SUFFERING FROM GAS POISONING, as the result of inhaling fumes during a chemical experiment at the Hugh Bell School, Middlesbrough, on Monday, two schoolboys were admitted to the North Riding Infirmary.

APPLICATION FORMS and particulars of the Associate Membership examination of the Institution of Chemical Engineers for 1929 may now be obtained from the Hon. Registrar at Abbey House, Victoria Street, Westminster, London.

THE SHEFFIELD FIRM of Thos. W. Ward, Ltd., celebrated its jubilee by a dinner at the Royal Victoria Hotel, Sheffield, on Monday. It was announced that a block of shares would be distributed to about 250 members of the staff who had been with the firm twenty years and upwards.

COPES' REGULATORS, LTD., Thanet House, 231, Strand, London, has recently been formed to handle exclusively and more advantageously the manufacture and sale of Copes' boiler feed water regulators. The directors are Mr. H. W. Spencer, Mr. C. H. Armstrong, Mr. E. W. Nick, and Mr. N. H. Brown.

UNEMPLOYED INSURED PERSONS in October in chemicals, explosives paint and varnish, oil, and match manufacture were as follows: chemicals manufacture, 5,586 (males 4,938, females 648); explosives manufacture, 914 (males 588, females 326); paint and varnish, etc., 827 (males 664, females 163); oil and grease, etc., 4,663 (males 3,902, females 761.)

SIR MAX MUSPRATT, referring to the changes of rating and local government proposed by the Government, stated at a meeting of the Liverpool Finance Committee on Friday, October 19, that unanimous reports had been adopted by a committee of Lancashire boroughs and by the Association of Municipal Corporations containing drastic amendments to the Government's proposals.

WAGE INCREASES VARYING from one halfpenny per week to threepence a week for adult males will be granted to about 80,000 operatives in the dyeing and finishing industry of Yorkshire, Lancashire, Cheshire, Derbyshire and parts of Scotland, on and from the first pay day in November to compensate them for an advance of one point in the cost of living at October 1 as compared with the figure at July 1.

MR. W. H. ROSS, chairman of the board of the Distillers' Co., Ltd., was entertained at luncheon in London on Thursday, October 18, by his co-directors, to mark his fiftieth year of service with the company. He was presented with a large silver Warwick vase. He said that while the company hoped to retain a good share of the Scotch whisky business, their future increase in business must come from the industrial side.

A SETTLEMENT was announced in the Lord Chief Justice's Court on Wednesday, of an action in which Mr. Harold Brooks Alder, of St. Albans, claimed damages from N. J. Fenner and H. B. Alder and Co., Ltd., paint and colour manufacturers, Fenchurch Street, London, for alleged wrongful dismissal from the managing directorship of the company. The defence was that Mr. Alder had failed to carry out his duties. The defendants agreed to withdraw all the charges made against Mr. Alder and to pay him £10,000 damages and costs.

VARIOUS PATENTS, processes, and patent applications for the manufacture of acetate of cellulose on the Continent and in South America are being acquired by Acetate and Acetate Products (Foreign Rights), which has been formed with a capital of £200,000 in 2s. shares; 1,000,000 shares were offered at par on Thursday. In addition to acetate of cellulose, the company will manufacture in its territories non-inflammable safety celluloid, non-inflammable films, acetate silk, splinterless glass, lacquer, brushing paints, and many other articles. The patents are similar to the British patent acquired by the Non-Inflammable Film Co., while the processes to be taken over are identical with those acquired by that undertaking.

THE DISTILLERS' CO., LTD., will produce acetic acid from alcohol at the new factory which they are erecting in Hull.

THE AMERICAN CHEMICAL SOCIETY announces that its membership, 16,300 members, shows a net increase of over 1,000 during 1928.

THE OIL AND COLOUR CHEMISTS' ASSOCIATION are holding a social evening and dance on Friday, November 30, and the Council hope that members will keep this date open.

DR. PAUL STAMBERGER will deliver the Gow lectures on "Colloid Chemistry and Its Relation to the Rubber Industry" at University College, London, on November 12, 14, 16, 19, and 21.

TWO EMPLOYEES of the Yorkshire Dyeware and Chemical Co., Ltd., of Hunslet, Herbert Wilkinson and Alfred Holmes, were gassed while at work on Monday. After treatment at the hospital they were able to go home.

THE JOINT COMMITTEE representing Lord Melchett's group of employers and the General Council of the Trades Union Congress reassembled on Thursday, October 18, and, it is understood, entered upon a discussion of the unemployment problem.

SIR WILLIAM HARDY, F.R.S., has been awarded the Laura-Leonard Prize of the German Kolloidgesellschaft. This prize was a special award, the usual award for this year being made to Professor H. Freundlich.

RECENT WILLS INCLUDE:—Mr. Frederick William Turner, lately chairman of the Scottish Australian Investment Co., Ltd., and a director of the Scottish Australian Mining Co., Ltd., £111,633 (net personalty £108,618).

THE DEPARTMENT OF JUSTICE, WASHINGTON, has approved the proposed amalgamation of the Grasselli Chemical Co. with the E.I. Du Pont de Nemours Co. and with the Chemical Corporation. The total consolidated assets of this combine will amount to about £100,000,000.

THE STANDING COMMITTEE (General Merchandise) appointed by the Board of Trade will hold an inquiry on November 5 and 6 as to whether an indication of origin shall be borne by rubber sheets, piping, tubing, cords, mats, matting and tiling, ebonite, vulcanite and certain other rubber articles.

UNIVERSITY NEWS.—At a meeting of the Council of Leeds University on Wednesday, October 16, the following appointments were made:—Mr. P. G. Marshall, Demonstrator in Bio-chemistry; Dr. K. Cooper, Research Assistant under the agreement with the Department of Scientific and Industrial Research.

PROFESSOR GEORGES CLAUDE, the French physical chemist, stated at a recent meeting of the Academy of Sciences, in Paris, that he had worked out a method of extracting krypton and xenon from the air in quantities larger than had hitherto been possible. He said that it was now possible to obtain several litres of these gases per day.

IRA STEPHENS, LTD., of Ashton-under-Lyne, have sent us their latest booklet on conveyor belt installation, with a supplement on bucket elevators. The theory and practice of the subject is dealt with and illustrated by diagrams, sectional drawings, and photographs. The firm manufacture all kinds of leather belting and other specialities.

LORD MELCHETT, who has been on an extensive visit to America in connection with the amalgamation of the Mond Nickel Co. and the International Nickel Corporation, left New York on Wednesday in the *Aquitania* on his return home. Before leaving he delivered an address to the National Conference of Major Industries on the subject of "The General Industrial Situation in Europe."

THE CHILEAN CONSULATE GENERAL in Liverpool has received the following news by cable:—The production and sale of Chilean nitrate increases daily in more considerable proportions. 259,377 tons were produced in September as compared to 143,799 in the same month of last year. In the nine months of this year 2,300,000 tons have been produced, as against 928,000 in the same period of 1927. The port of Iquique has just created a record by loading 500,854 quintals in one week, a figure which has never been reached before, not even during the great activity in the nitrate industry caused by the war. The Producers' Association has contracts in hand for the shipment of 140,000 tons in October and November.

ARTIFICIAL SILK NEWS.—Negotiations have been completed for the purchase of Tollington Mill, near Bury, from the Calico Printers' Association, by British Breda, Ltd., who will build an artificial silk factory there instead of at Duffield. Breda will take possession next month.—A luncheon was held in London on Friday, October 19, at which Count Callimachi, a coeval of Chardonnet, was entertained, and when the formation of British Cuprammonium Silk Spinners, Ltd., was announced. The firm has a capital of £1,100,000, and has bought a site at Kendal for a factory at which Count Callimachi will be technical adviser.—Big developments are anticipated in the dyeing and finishing of artificial silk and cotton mixtures as a result of the commercial application of the new Lispro process, for the working of which Lispro, Ltd. has been formed.

Obituary

MR. F. H. HILLMAN, vice-president of the Standard Oil Co., of California, on September 10, aged 66.

References to Current Literature

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ANALYSIS.—The determination of iron carbonyl. R. H. Griffith and G. C. Holliday. *J.S.C.I.*, October 19, pp. 311–312T.

APPARATUS.—Apparatus for chromic anhydride oxidations. W. F. Short. *J. Chem. Soc.*, September, p. 2630.

The densi-tensimeter. A. Smits. *J. Chem. Soc.*, September, pp. 2409–2410. An apparatus for the simultaneous determination of vapour pressure and vapour density.

GENERAL.—The influence of intensive drying on inner equilibria. III. A. Smits. *J. Chem. Soc.*, September, pp. 2399–2409.

Road surfacing materials. W. J. A. Butterfield. *J.S.C.I.*, October 19, pp. 293–309T.

ORGANIC.—A new reaction of certain diazosulphonates derived from β-naphthol-1-sulphonic acid.—II. The constitution of nitro- and amino-phenylphthalazones. F. M. Rowe and E. Levin.—III. Preparation of phthalazine, phthalazone, and phthalimidine derivatives from *m*-nitroaniline. F. M. Rowe, M. A. Himmat, and E. Levin. *J. Chem. Soc.*, September, pp. 2550–2555, 2556–2563.

SUGAR.—The synthesis of cane sugar: The end of a chapter. E. F. Armstrong. *Nature*, October 13, pp. 578–579.

United States

ADSORPTION.—The absorption of gases by graphitic carbon. II. X-ray investigation of the adsorbents. H. H. Lowry and R. M. Bozorth. *J. Phys. Chem.*, October, pp. 1524–1527.

ANALYSIS.—The analysis of sulphonated oils. W. H. Thomas, *Amer. Dyestuff Reporter*, September 17, pp. 587–589. Deals with water and ash tests; titration methods; advances over older methods; and the preferred sample.

The oxalate method for separating calcium and magnesium. W. T. Hall. *J. Amer. Chem. Soc.*, October, pp. 2704–2707. For the precipitation of calcium oxalate in the presence of magnesium ions an excess of ammonium oxalate is necessary. If this excess is properly regulated, it is possible to precipitate pure calcium oxalate. If, however, a very large quantity of ammonium oxalate is present, the precipitation of magnesium ammonium phosphate is incomplete even after standing.

BOILER WATER TREATMENT.—Treatment of boiler feed waters of low incrustant content. S. C. Johnson. *Ind. Eng. Chem.*, October, pp. 1071–1072.

DYESTUFFS.—Some chemical and physical properties of anthracene blue. R. L. Drew. *Amer. Dyestuff Reporter*, September 17, p. 591. A comparison of the fastness and other properties of Anthracene Blue WR and Anthracene Blue WG.

ECONOMICS.—Research and profits. C. S. Miner. *Ind. Eng. Chem.*, October, pp. 1069–1071.

GENERAL.—Dehumidification of air. C. S. Keevil and W. K. Lewis. *Ind. Eng. Chem.*, October 1, pp. 1058–1060.

Butanol fermentation process. C. L. Gabriel. *Ind. Eng. Chem.*, October, pp. 1063–1067. Discusses the industrial development of the production of butanol and acetone by fermentation, particularly with regard to the work of the Commercial Solvents Corporation of the United States.

By-products of chemical warfare. A. A. Fries. *Ind. Eng. Chem.*, October, pp. 1079–1084.

Manufacture of carbon dioxide. H. E. Howe. *Ind. Eng. Chem.*, October, pp. 1091–1094. Deals more especially with the manufacture of solid carbon dioxide for refrigerating purposes by the Dry Ice Corporation.

ORGANIC.—A modification of the Skraup synthesis of quinoline. B. E. Cohn and R. G. Gustavson. *J. Amer. Chem. Soc.*, October, pp. 2709–2711. By the addition of acetic and sulphuric acid to the Skraup mixture the reaction may be conducted smoothly and with safety, and without decided loss of yield.

Certain new oxidation reactions of aldehydes. J. B. Conant and J. G. Aston. *J. Amer. Chem. Soc.*, October, pp. 2783–2798.

German

ANALYSIS.—The application of methyl orange to the detection of free chlorine and chloroamines. *Chemiker-Zeitung*, October 20, p. 826.

APPARATUS.—"Analysis ultra-lamps" for investigations by fluorescence analysis. F. Müller. *Chem. Fabrik*, September 19, pp. 561–562.

A new type of thermostat. V. Cupr. *Zeitschrift Elektrochem.*, October, pp. 679–682.

ARTIFICIAL SILK.—Influence of metal salts on the tensile strength of artificial silk. J. Eggert. *Chemiker-Zeitung*, October 10, pp. 794–795.

GENERAL.—The electrolytic oxidation of formaldehyde in alkaline solution. E. Müller and S. Takegami. *Zeitschrift Elektrochem.*, October, pp. 704–713.

The action of mercury salts on iron pentacarbonyl. H. Hock and H. Stuhlmann. *Berichte*, October 10, pp. 2097–2101. The compounds $Fe(CO)_5$, $HgCl_2$ and $Fe(CO)_4$, Hg_2Cl_2 have been isolated and examined.

The action of light on acetylene. H. Reinicke. *Zeitschrift angewandte Chem.*, October 13, pp. 1144–1146. Daylight and sunlight have no effect on pure, dry acetylene stored in glass or quartz. Polymerisation only sets in when mercury light is used, and only radiation of wavelength less than 300 μμ is effective. Oxygen and moisture disturb the polymerisation reaction, the latter with aldehyde formation.

ORGANIC.—Methods for the preparation of nitro- and chloronitro-olefines. E. Schmid and G. Rutz. *Berichte*, October 10, pp. 2142–2148.

α-Methylaminopyridine and some of its derivatives. A. E. Tschitschibabin and I. L. Knunjanz. *Berichte*, October 10, pp. 2215–2217.

PLANT.—The efficiency and economics of so-called colloid mills. F. Hebler. *Chemische Fabrik*, October 3, pp. 581–582.

Electro-filters in the chemical industry. Nachtweh. *Chem. Fabrik*, October 3, p. 582; October 10, p. 593.

SULPHURIC ACID—The activity of various contact substances in the sulphuric acid contact process. I. B. Neumann, H. Panzner, and E. Goebel. *Zeitschrift Elektrochem.*, October, pp. 696–704. Describes experiments in which platinum, silver vanadate, vanadic acid, vanadic acid containing copper vanadate, and tungstic acid, respectively, were used as contact substances.

TAR.—Contribution to the knowledge of tar oils. R. Weiszgerber. *Berichte*, October 10, pp. 2111–2119.

Miscellaneous

ANALYSIS.—The quantitative separation of barium and calcium. M. and M. Lemarchands. *Comptes Rendus*, October 8, pp. 601–603 (in French).

APPARATUS.—An automatic temperature regulator for the A.C. resistance furnace. K. Nagai and R. Hara. *J. Soc. Chem. Ind. Japan* (supplemental binding), August, pp. 183–184B (in English).

CELLULOSE ACETATE.—Investigations on films and threads of cellulose acetate.—I. The connection between the quality of the cellulose acetate and the quality of the film.—II. The connection between the quality of the film and the conditions of formation. G. Kita and G. Kanno.—III. The spinning of cellulose acetate threads. G. Kita, T. Umatsu, and S. Masuda. *J. Soc. Chem. Ind. Japan* (supplemental binding), pp. 176–177B, 177–178B, 178–179B (in German).

LIME.—The lime industry of the Philippine Islands. F. D. Reyes. *Philippine Journ. Science*, June, pp. 139–153 (in English).

NITROCELLULOSE.—Studies on the esterification of cellulose and cellulose esters.—I. Velocity of nitration of cotton fibre.—2. The decrease in viscosity of cellulose nitrate with the duration of nitration. R. Atsuki and M. Ishiwara. *Proceedings Imperial Academy Japan*, July, pp. 382–385, 386–388 (in English).

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Patent Literature

The following information is prepared from published Patent Specifications and from the Illustrated Official Journal (Patents) by permission of the Controller to H.M. Stationery Office. Printed copies of full Patent Specifications accepted may be obtained from the Patent Office, 25, Southampton Buildings, London, W.C.2, at 1s. each.

Abstracts of Complete Specifications

297,129. Derivatives from Condensation Products of Anthraquinone, Manufacture of. W. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, May 12, 1927.

These derivatives are obtained by heating anthrone or a derivative or substitution product with cinnamic aldehyde or an aldehyde addition product such as the bisulphite compound, with or without an acid condensing agent such as sulphuric acid, zinc chloride, or phosphorus oxychloride. The products can be condensed into benzanthrones with or without the isolation of the intermediate cinnamylidene anthrones. Examples are given of the condensation of anthrone with cinnamic aldehyde, and further treatment with aluminium chloride to obtain corresponding benzanthrone products. The treatment of cinnamylidene anthrone with a chloronaphthalene, *p*-phenetidine, and other substances is also described, as well as the condensation of anthrone derivatives with cinnamic aldehyde.

297,133. Vat Dyestuffs of the Anthraquinone Series, Manufacture of. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, June 11, 1927.

Anthraquinone derivatives are fused with aluminium chloride in the presence of an aromatic tertitary base, such as pyridine, quinoline, or dimethyl-aniline. By means of these additions a smaller quantity of aluminium chloride can be employed, and the temperature of fusion may be 100° C. lower than that necessary when employing aluminium chloride alone. Thus anhydrous aluminium chloride may be mixed with 4 parts of dry pyridine yielding a crystalline compound, to which the substance which is to be subjected to fusion is added. The resulting product is partly in the form of a leuco compound, and the dyestuff is obtained by oxidation. Examples are given of the fusion of 4-benzoyl-amino-1 : 1^1-dianthraquinonyl-amine with aluminium chloride and pyridine, and similar fusion of 1 : 2^1-dianthraquinonyl-amine ; the dianthraquinonyl-amine derivative obtained by condensation of 4-bromo-1 : 9-anthraquinone-methyl-pyridone with 1-amino-anthraquinone ; 1 : 1^1dianthraquinonyl-1 : 4-diaminoanthraquinone ; and 2-amino-anthraquinone.

297,135. Hydrogen, Process for the Production of. M. Casale-Sacchi, Villa Porticciuolo, Rapallo, Italy. Application date, June 13, 1927.

The object is to obtain hydrogen or hydrogen mixtures substantially free from injurious catalyst poisons. A mixture of carbon dioxide and oxygen is passed over coal at a temperature above 1,000° C., yielding carbon monoxide and only a very small proportion of dioxide. Any sulphur in the fuel is converted into sulphur dioxide, which, together with the carbon dioxide, is removed by alkaline absorption. The carbon monoxide is then treated with steam in the presence of a catalyst to obtain hydrogen and carbon dioxide, the latter being recovered for use in the production of carbon monoxide. If a mixture of nitrogen, oxygen, and carbon dioxide is employed, a mixture of nitrogen and hydrogen can be obtained in the proportions required for ammonia synthesis.

297,179. Benzene and its Homologues from Mixture of Oxides of Carbon and Hydrogen, Production of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, July 13, 1927.

A mixture of an oxide of carbon and hydrogen is passed at a temperature above 300° C. and pressure of 10–15 atmospheres over an iron catalyst as described in Specification No. 293,572 (see The Chemical Age, Vol. XIX, p. 126). The products contain gaseous olefines, and gaseous homologues of methane, such as ethane. The gases are then heated to 600°–800° C., preferably in the absence of iron, and in the presence of a catalyst such as copper as described in Specification No. 258,608 (see The Chemical Age, Vol. XV, p. 502). An example is given of the treatment of water gas to obtain a liquid containing 80 per cent. benzene, the catalyst employed in the first stage being iron-silver.

297,212. Aromatic Amines, Production of. J. Y. Johnson, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, September 10, 1927.

Aromatic amines are obtained by reducing the corresponding impure industrial nitro compounds, particularly those which are contaminated with sulphur compounds. The reduction is effected in the liquid phase with hydrogen or carbon monoxide, which may also contain sulphur compounds. Suitable catalysts consist of metals of groups 2–8 of the periodic system, particularly the heavy metals, amd also copper, silver and gold. The presence of the impurities in the reagents modifies the action of the catalyst, and the reaction does not proceed further than the formation of the amines. If the aromatic nitro compound to be reduced is already pure, sulphur compounds may be added to reduce the activity of the catalyst. Examples are given of the reduction of crude nitro benzene to aniline in the presence of Swedish spongy iron, iron powder, and nickel, respectively.

297 231. Diolefines from Naphtha, Naphtha Fractions and Naphtha Residues. Production of. B. W. Bysow, 138, Obvodry Kanal, Leningrad. Application date, October 20, 1927.

Naphtha, or fractions or residues, are vaporised and preheated to 300°–400° C., and then decomposed in a short zone at 750°–1,000° C. in the presence of a catalyst such as iron, nickel, or aluminium. The products are allowed to expand and to cool as quickly as possible, and then condensed and fractionated. The final diolefines can be converted into rubber by polymerisation.

297,234. Derivatives of Anthanthrone, Process of Manufacture of. A. Carpmael, London. From I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. Application date, October 25, 1927.

Sulpho or alkoxy derivatives of naphtho-styril (Specifications Nos. 276,126 and 278,100 (see The Chemical Age, Vol. XVII, pp. 290 and 418) are treated with alkaline saponifying agents to obtain the corresponding derivatives of the 1-aminonaphthalene-8-carboxylic acid. Their diazo compounds are treated with reducing agents to obtain derivatives of 1 : 1^1-dinaphthyl-8 : 8^1-dicarboxylic acid. The latter are subjected to alkali fusion to convert the sulpho into hydroxy groups, and the oxy and alkoxy derivatives of the 1 : 1^1-dinaphthyl 8 : 8^1-dicarboxylic acid thus formed are treated with acid condensing agents such as sulphuric acid or zinc chloride. The oxy-anthanthrones prepared in this manner may be alkylated to obtain the corresponding alkoxy anthanthrones. In an example, 5-ethoxynaphthostyril (see Specification No. 276,126) is saponified to the 5-ethoxy-1-amino-naphthalene-8-carboxylic acid. The acid is diazotised, and the diazo compound treated with cuprous oxide to obtain 5 : 5^1-diethoxy-1 : 1^1-dinaphthyl-8 : 8^1-dicarboxylic acid, which can be isolated by acidification. This acid may be added to concentrated sulphuric acid to obtain a solution which is at first orange red, and then green with red fluorescence. The mixture is poured into water to separate the dyestuff which gives violet shades on cotton from a hydrosulphite vat changing to reddish-orange on exposure to air. Other examples are also given.

297,366. Dyestuff Intermediates, Production of. I. B. Anderson, R. F. Thomson, J. Thomas, and Scottish Dyes, Ltd., Earl's Road, Grangemouth, Stirling. Application dates, March 28 and June 25, 1927.

In the usual preparation of pyrazole anthrones, hydrazine is heated with an α-halogen anthraquinone in pyridine so that halogen acid is eliminated. The anthraquinone-1-hydrazine is isolated, and converted into the corresponding pyrazole anthrone by methods involving the use of a solvent and a

dehydrating agent. In this invention, the anthraquinone-1 : hydrazine is not isolated, but hydrazine is condensed with an α-halogen-anthraquinone in the presence of an oxide of an alkaline earth metal or a hydroxide or carbonate of an alkali or alkaline earth metal or an alkali salt of a weak volatile organic acid. The reagents can be employed mixed with water instead of in a dry state, which renders it easier to obtain a thorough mixture. The condensation is effected at 200° C. preferably in a sealed vessel. If a limited quantity of an alkaline earth metal oxide is employed, the reaction stops at the formation of anthraquinone-α-hydrazine. Examples of the preparation of pyrazole anthrone from 1-chlor-anthraquinone and 1-chlor-2-methyl-anthraquinone, and the preparation of anthraquinone-α-hydrazine employing various alkaline reagents such as calcium oxide or hydroxide, sodium carbonate, calcium carbonate, or sodium acetate, are given.

NOTE.—Abstracts of the following specifications which are now accepted, appeared in THE CHEMICAL AGE when they became open to inspection under the International Convention : —267,535 (I.G. Farbenindustrie Akt.-Ges.) relating to manufacture of hydrogen, see Vol XVI, p. 468 ; 272,908 (I.G. Farbenindustrie Akt.-Ges) relating to metallic compounds of azo dyestuffs, see Vol. XVII, p. 200.

International Specifications not yet Accepted

295,694. DYES AND INTERMEDIATES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, August 17, 1927.

Cyanoaryl-*o*-thioglycollic acids are treated with hydrogen peroxide in alkaline solution to hydrolyse them to the arylcarboxylic-amide-*o*-thioglycollic acids, which may be precipitated with acid and separated. These acids can be converted into oxythio-naphthenes by further treatment with alkali.

295,705. HYDROCARBONS. C. Epner, 3, Kuno-Fischerstrasse, Heidelberg, Germany. International Convention date, August 18, 1927.

Ethylene is polymerized by means of dark or silent electric discharges at ordinary or increased temperatures, with or without catalysts. The products include fractions suitable for motor fuel and lubricating oil, and also hydrogen which may be used to saturate the unsaturated hydrocarbons in presence of catalysts .

295,716. DYES. E. I. Du Pont de Nemours and Co., Wilmington, Del., U.S.A. (Assignees of J. G. Kern, 907, Jefferson St., Wilmington, Del., U.S.A.) International Convention date, August 19, 1927.

The sodium salts of the leuco esters of vat dyes are dissolved in alkylolamines, or treated with an organic acid to liberate the acid esters which are then converted into the alkylolamine salts. The leuco esters are thereby stabilised. In an example, Soledon Jade Green paste is treated with acetic acid to precipitate the free leuco sulphuric acid ester, which is then dissolved in diethanolamine, mono- or tri-ethanolamine, or methyl-dipropanediolamine, preferably in the absence of oxygen.

295,943. ANTHRAQUINONE DERIVATIVES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany, International Convention date, August 18, 1927.

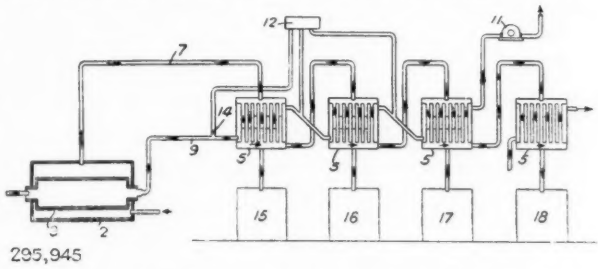
1 : 2 : 3 : 4-tetrahydro-anthraquinone or its homologues or substitution products are nitrated with a mixture of nitric and sulphuric acids. A nitro group enters the *ar*-nucleus, and no dehydrogenation occurs. The product is extracted with alcohol, and the residue recrystallised from glacial acetic acid consists of *ar*-α-nitro-1 :2 : 3 : 4-tetrahydro-anthraquinone. The alcoholic extract yields a small quantity of the *ar*-β-nitro-derivative which may be reduced and acylated to obtain an acetylamino compound. The same compound is obtained by hydrogenating β-acetylamino-anthraquinone. The products are intermediates in the manufacture of dyes and pharmaceutical products, and other examples are given.

295,944. DYES. Soc. of Chemical Industry in Basle, Switzerland. International Convention date, August 19, 1927 Addition to 289,094 (see THE CHEMICAL AGE, Vol. XVIII, p. 615).

Diazotized 5-nitro-2-aminophenol is coupled with an N-acidyl-2-amino-5-naphthol-7-sulphonic acid, and the product treated with an agent yielding chromium. The acidyl radicles are those derived from formic, acetic, and other monobasic fatty acids, benzoic, phthalic, and other arylcarboxylic acids, carbonic acid, oxalic acid, sulphuric acid esters, and arylsulphuric acid esters. Examples are given

295,945–6. DISTILLING TAR. International Combustion Engineering Corporation, 43, Broad Street, New York. (Assignees of W. Runge, 136, North Arlington Avenue, East Orange, N.J., U.S.A.) International Convention date, September 21, 1926.

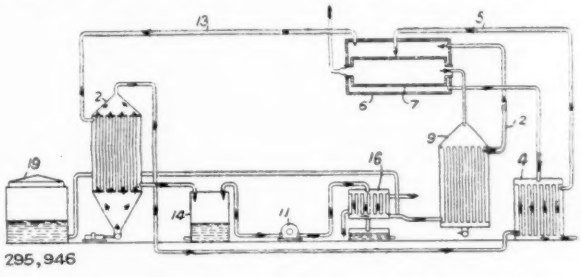
295,945. Tar, oil, etc., is heated in a still 2 by means of hot flue gases passing through a rotating chamber 3, so that the latter carries a film of tar on its surface. Vapour



295,945

passes through a pipe 7 to tubular condensers 5, and the flue gases pass through a pipe 9 to the condensers 5 to cause different fractions to be condensed in the tubes, and these are collected in vessels 15, 16, 17, 18. The temperatures in the condensers are regulated by a thermostatic device 12 controlling the admission of cold air through pipes 14.

295,946. The still 6 is of the kind described above, and tar is supplied to it through heat exchangers 2, 4, and pipe 5.



295,946

Vapour is drawn off through pipe 13 to heat exchangers 2, 16, and trap 14 to receive condensate. The gases are preheated by hot flue gases in an exchanger 9, and again passed into the still through pipe 12.

295,947–8–9. DESTRUCTIVE HYDROGENATION. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, August 7, 1926.

295,947. Catalysts for the destructive hydrogenation of carbonaceous materials consist of metals of the 5th, 7th, or 8th group, or their compounds, with aluminium or its compounds.

295,948. These catalysts consist of elements of the 2nd group or their compounds with uranium or its compounds.

295,949. These catalysts consist of uranium or its compounds with aluminium or its compounds.

295,990. ALKYLATED NAPHTHALENES. I.G. Farbenindustrie Akt.-Ges., Frankfort-on-Main, Germany. International Convention date, August 22, 1927. Addition to 265,601 and 273,665. (See THE CHEMICAL AGE, Vol. XVI, p. 381 and Vol. XVII, p. 221.)

In the production of alkylated naphthalene derivatives, propylene or its higher homologues reacts with naphthalene or a derivative in the presence of a Friedel-Crafts catalyst such as aluminium chloride.

296,000. DISTILLING OILS. S. Seelig, 7, Fasanenstrasse, Charlottenburg, Berlin. International Convention date, August 22, 1927.

Oils containing resins, benzene, etc., are distilled by passing through a molten metal bath after passing through an asphalt separator and distilling off the benzene to prevent clogging of the reaction vessel.

296,048. SULPHUR TRIOXIDE. Selden Co., 339, 2nd Avenue, Pittsburg, U.S.A. (Assignees of A. O. Jaeger, 9, Grandview, Avenue, Crafton, Pa., U.S.A.) International Convention date, August 24, 1927.

Catalysts for producing sulphur trioxide contain zeolites formed by the interaction of one or more silicates, metallates, and metal salts, the basic radicals of which enter the non-exchangeable part of the zeolite. The silicate may be an alkali metal silicate, the metallate may be an alkali metal compound of aluminium, chromium, zinc, etc., and the metal salt may be a compound of copper, silver, zinc, lead, iron, etc. Purification of the reaction gases, other than dust removal, is not necessary.

LATEST NOTIFICATIONS.

298,599. Process for dissociating sulphur vapour. I.G. Farbenindustrie Akt.-Ges. October 12, 1927.

298,600. Process for adding propylene to cresols to form propylated and isopropylated cresols and for splitting off propylene. Rheinische Kampfer-Fabrik Ges. October 12, 1927.

298,628. Method of treating latex, and product obtained thereby. Naugatuck Chemical Co. October 14, 1927.

298,894. Process of and apparatus for denitrating residuary acids. Schmid, Dr. A., and Meissner, J. October 15, 1927.

298,607. Method of treating gypsum and resulting product. Gamarra, C. October 12, 1927.

298,640. Process for the manufacture of dinaphthalene dioxide quinone. I.G. Farbenindustrie Akt.-Ges. October 13, 1927.

298,611. Denaturing-agents for alcohol. I.G. Farbenindustrie Akt.-Ges. October 12, 1927.

298,617. Denaturing-agents for alcohol. I.G. Farbenindustrie Akt.-Ges. October 12, 1927.

298,648. Printing on wool. I.G. Farbenindustrie Akt.-Ges. October 13, 1927.

298,907. Manufacture of azo-dyestuffs. Imray, O. Y. October 13, 1927.

298,914. Coating-materials and process of preparing same. Imperial Chemical Industries, Ltd. October 15, 1927.

Specifications Accepted with Date of Application

273,774. α-anthraquinonyl ketones, Manufacture of. I.G. Farbenindustrie Akt.-Ges. July 5, 1926. Addition to 271,884.

274,076. Concentrated acetic acid (or a mixture of acetic acid and acetic anhydride), Manufacture of—with the simultaneous production of unsaturated hydrocarbons. Holzverkohlungs Industrie Akt.-Ges. July 6, 1926.

277,628. Stable solutions of peroxides, persalts, and peracids, Manufacture of. Oesterreichische Chemische Werke Ges. September 16, 1926.

283,194. Mixed manures, Production of. Rhenania Kunheim Verein Chemischer Fabriken Akt.-Ges. January 8, 1927.

298,098. Dyestuffs. L. B. Holliday and Co., Ltd., and C. Shaw. May 28, 1927.

298,101. Derivatives of the triarylmethane series, Manufacture of. O. Y. Imray. (*I.G. Farbenindustrie Akt.-Ges.*) June 29, 1927.

298,103. Tinned scrap iron, Process for the treatment of. A. Dossman. June 29, 1927.

298,108. Chemical reactions between gases or vapours, Apparatus for carrying out. H. Harter. July 1, 1927.

298,141. Slag and the like, Treatment of—for the production of aluminium sulphate and other by-products. M. Odling and A. A. Street. May 4, 1927.

298,142. Catalytic process for oxidation of organic and inorganic substances. O. Y. Imray. (*Monsanto Chemical Works.*) May 25, 1927.

298,279. Amino-anthraquinones, their homologues and substitution products from the corresponding leuco-amino compounds, Process for the manufacture of. A. Carpmael. (*I.G. Farbenindustrie Akt.-Ges.*) July 11, 1927.

298,280. Non-dyeing thio derivatives of phenols, Process for the manufacture of. I. G. Farbenindustrie Akt.-Ges., and A. Thauss. July 11, 1927. Addition to 173,313.

298,284. Vat dyestuffs, Manufacture of. O. Y. Imray. (*I.G. Farbenindustrie Akt.-Ges.*) July 12, 1927.

298,301. Separation of cobalt from other materials. S. C. Smith. July 25, 1927.

298,336. Compounds of the morpholine series, Manufacture of. Imperial Chemical Industries, Ltd., J. B. Payman, H. A. Piggott. September 1, 1927.

298,349. Aldol, Production of. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) September 19, 1927.

298,393. 1-methyl-3-oxy-4-isopropyl-benzene, Production of a derivative of. S. Edelman. November 16, 1927.

298,248. Anthraquinone hydroazine dyestuffs, Production of. W. Smith, J. Thomas, and Scottish Dyes, Ltd. April 1, 1927.

298,122. Alloys resistant to chemical action. J. Y. Johnson. (*I.G. Farbenindustrie Akt.-Ges.*) June 30, 1927. Addition to 297,165.

Applications for Patents

British Celanese, Ltd. Manufacture of synthetic resins. 30,384, 30,385, 30,386. October 20. (United States, October 21, 1927.)

California Cyanide Co., Inc. Production of hydrocyanic acid. 30,277. October 19. (United States, October 19, 1927.)

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of sulphonic acids, etc. 29,739. October 15.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Preparing materials to be charged into rotary furnaces. 29,740. October 15.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of diazoamino compounds. 29,796. October 15.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of water-soluble compounds of indigoid dyestuffs. 30,341. October 19.

Carpmael, A., and I.G. Farbenindustrie Akt.-Ges. Manufacture of colour lakes and pigment dyestuffs. 30,342. October 19.

Chemieverfahren Ges. Preparation of alkali sulphates. 29,910. October 16. (Germany, November 18, 1927.)

Chemieverfahren Ges. Production of fertiliser. 29,911. October 15. (Germany, December 10, 1927.)

Conte, J. Ylla-. Synthetic production of benzene, etc. 30,438. October 20. (Spain, October 26, 1927.)

Fabrique Nationale de Produits Chimiques et d'Explosifs Soc. Anon. Treating carbonaceous materials to obtain distillation products. 30,265. October 19. (Belgium, August 17.)

Fleming, J. S. B. Treatment of nitrocellulose. 29,901. October 16.

Fuchs, K., and Katscher, E. Method of producing sulphuric acid and halogen substitutes. 30,325. October 19. (Austria, October 21, 1927.)

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of insulated articles for electrical engineering. 29,694. October 15.

I.G. Farbenindustrie Akt.-Ges., and J. Y. Johnson. Manufacture of products resembling wax. 29,695. October 15.

I.G. Farbenindustrie Akt.-Ges., and Johnson J. Y. Concentration of organic compounds. 30,152. October 18.

I.G. Farbenindustrie Akt.-Ges., and Johnson J. Y. Production of hydrogen from methane. 30,153. October 18.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of vat dyestuffs. 30,154. October 18.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of vulcanized rubber. 30,155. October 18.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Destructive hydrogenation of coal, etc. 30,283. October 19.

I.G. Farbenindustrie Akt.-Ges., and Johnson J. Y. Process of activation of proteoses. 30,284. October 19.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Manufacture of products of nature of resin, etc. 30,408. October 20.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of esters of α-hydroxy carboxylic acids. 30,409. October 20.

I.G. Farbenindustrie Akt.-Ges., and Johnson, J. Y. Production of hydrogen and phosphoric acid. 30,410. October 20.

I.G. Farbenindustrie Akt.-Ges. Manufacture of acetone. 29,882. October 16. (Germany, October 21, 1927.)

I.G. Farbenindustrie Akt.-Ges. Manufacture of oxythionaphthenes. 30,007. October 17. (Germany, October 17, 1927.)

I.G. Farbenindustrie Akt.-Ges. Protecting wool, etc., from moth. 30,178. October 18. (Germany, October 20, 1927.)

I.G. Farbenindustrie Akt.-Ges. Filling solid articles into receptacles. 30,188. October 18. (Germany, October 19, 1927.)

I.G. Farbenindustrie Akt.-Ges. Production of hydrocarbons, etc. 30,281, 30,282. October 19. (Germany, August 7, 1926.)

I.G. Farbenindustrie Akt.-Ges. Producing dyeings and prints. 30,416. October 20. (Germany, October 20, 1927.)

Imperial Chemical Industries, Ltd. Preparing coating materials. 29,774. October 15. (United States, October 15, 1927.)

Imperial Chemical Industries, Ltd., Treatment of nitrocellulose. 29,901. October 16.

Imray, O. Y. Manufacture of azo-dyestuffs. 29,709. October 15. (Germany, October 13, 1927.)

Kali-Industrie Akt.-Ges., Kristensson, A., and Thorssell, C. T. Production of nitrates of the alkalies, etc. 30,203. October 18. (Germany, November 18, 1927.)

May and Baker, Ltd. Preparation of organo-metallic compounds. 30,328. October 19.

Plauson, H., and Potts, H. E. Varnish substitutes, etc. 29,030. October 15.

Soc. of Chemical Industry in Basle. Production of active substances from glands. 30,290. October 19. (Switzerland, October 20, 1927.)

Suida, H. Production of concentrated acetic acid. 29,173. October 10. (Austria, January 5.)

Suida, H. Production of lactic acid. 29,367. October 11. (Austria, January 5.)

Young, H. J. Apparatus for chemical purification, etc., of liquids. 29,989. October 17.

Weekly Prices of British Chemical Products

The prices and comments given below respecting British chemical products are based on direct information supplied by the British manufacturers concerned. Unless otherwise qualified, the figures quoted apply to fair quantities, net and naked at makers' works.

General Heavy Chemicals

ACID ACETIC, 40% TECH.—£19 per ton.

ACID BORIC, COMMERCIAL.—Crystal, £30 per ton; powder, £32 per ton; extra fine powder, £34 per ton.

ACID HYDROCHLORIC.—3s. 9d. to 6s. per carboy d/d, according to purity, strength, and locality.

ACID NITRIC, 80° Tw.—£21 10s. to £27 per ton, makers' works, according to district and quality.

ACID SULPHURIC.—Average National prices f.o.r. makers' works, with slight variations up and down owing to local considerations; 140° Tw., Crude Acid, 60s. per ton. 168° Tw., Arsenical, £5 10s. per ton. 168° Tw., Non-arsenical, £6 15s. per ton.

AMMONIA ALKALI.—£6 15s. per ton f.o.r. Special terms for contracts.

BISULPHITE OF LIME.—£7 10s. per ton, f.o.r. London, packages free.

BLEACHING POWDER.—Spot, £9 10s. per ton d/d; Contract, £8 10s. per ton d/d, 4-ton lots.

BORAX, COMMERCIAL.—Crystals, £19 10s. to £20 per ton; granulated, £19 per ton; powder, £21 per ton. (Packed in 2-cwt. bags carriage paid any station in Great Britain.)

CALCIUM CHLORIDE (SOLID).—£5 to £5 5s. per ton d/d carr. paid.

COPPER SULPHATE.—£25 to £25 10s. per ton.

METHYLATED SPIRIT 61 O.P.—Industrial, 1s. 3d. to 1s. 8d. per gall., pyridinised industrial, 1s. 5d. to 1s. 10d. per gall.; mineralised, 2s. 4d. to 2s. 8d. per gall.; 64 O.P., 1d. extra in all cases.

NICKEL SULPHATE.—£38 per ton d/d.

NICKEL AMMONIA SULPHATE.—£38 per ton d/d.

POTASH CAUSTIC.—£30 to £33 per ton.

POTASSIUM BICHROMATE.—4½d. per lb.

POTASSIUM CHLORATE.—3½d. per lb., ex wharf, London, in cwt. kegs.

SALAMMONIAC.—£45 to £50 per ton d/d. Chloride of ammonia, £37 to £45 per ton, carr. paid.

SALT CAKE.—£3 15s. to £4 per ton d/d. In bulk.

SODA CAUSTIC, SOLID.—Spot lots delivered, £15 2s. 6d. to £18 per ton, according to strength; 20s. less for contracts.

SODA CRYSTALS.—£5 to £5 5s. per ton, ex railway depots or ports.

SODIUM ACETATE 97/98%.—£21 per ton.

SODIUM BICARBONATE.—£10 10s. per ton, carr. paid.

SODIUM BICHROMATE.—3½d. per lb.

SODIUM BISULPHITE POWDER, 60/62%.—£17 10s. per ton delivered for home market, 1-cwt. drums included; £15 10s. f.o.r. London.

SODIUM CHLORATE.—2½d. per lb.

SODIUM NITRITE, 100% BASIS.—£27 per ton d/d.

SODIUM PHOSPHATE.—£14 per ton, f.o.b. London, casks free.

SODIUM SULPHATE (GLAUBER SALTS).—£3 12s. 6d. per ton.

SODIUM SULPHIDE CONC. SOLID, 60/65.—£13 5s. per ton d/d. Contract, £13. Carr. paid.

SODIUM SULPHIDE CRYSTALS.—Spot, £8 12s. 6d. per ton d/d. Contract, £8 10s. Carr. paid.

SODIUM SULPHITE, PEA CRYSTALS.—£14 per ton f.o.b. London, 1-cwt. kegs included.

Coal Tar Products

ACID CARBOLIC CRYSTALS.—6½d. to 6¾d. per lb. Crude 60's, 2s. per gall. 1929—1s. 11d. per gall.

ACID CRESYLIC 99/100.—2s. 5d. to 3s. per gall. 97/99.—2s. 4d. to 2s. 5d. per gall. Pale, 95%, 2s. 2d. to 2s. 3d. per gall. Dark, 1s. 9d. to 1s. 11d.

ANTHRACENE.—A quality, 2d. to 2½d. per unit. 40%, £5 per ton.

ANTHRACENE OIL, STRAINED.—8d. to 8½d. per gall. Unstrained, 7¾d. to 8d. per gall.

BENZOLE.—Prices at works: Crude, 10½d. to 11d. per gall.; Standard Motor, 1s. 4½d. to 1s. 5d. per gall.; 90%, 1s. 7d. to 1s. 8d. per gall.; Pure, 1s. 10d. to 1s. 11d. per gall.

TOLUOLE.—90%, 1s. 5d. to 1s. 11d. per gall. Firm. Pure, 1s. 10d. to 2s. per gall.

XYLOL.—1s. 3d. to 2s. 4d. per gall. Pure, 1s. 6d. to 2s. 8d. per gall.

CREOSOTE.—Cresylic, 20/24%, 9d. per gall.; Heavy, 7d. to 8d. per gall. Standard specification, middle oil, 6½d. to 6¾d. per gall. 5¾d. to 6d. per gall. ex works. Salty, 7½d. per gall.

NAPHTHA.—Crude, 8½d. to 9d. per gall. Solvent 90/160, 1s. 1½d. to 1s. 2½d. per gall. Solvent 95/160, 1s. 2d. to 1s. 7d. per gall. Solvent 90/190, 11d. to 1s. 4d. per gall.

NAPHTHALENE CRUDE.—Drained Creosote Salts, £5 per ton. Whizzed, £8 per ton. Hot pressed, £8 10s. per ton.

NAPHTHALENE.—Crystals, £12 5s. to £14 10s. per ton. Quiet. Flaked, £14 to £15 per ton, according to districts.

PITCH.—Medium soft, 42s. 6d. to 45s. per ton, f.o.b., according to district. Nominal.

PYRIDINE.—90/140, 5s. to 6s. 6d. per gall. 90/180, 2s. 3d. to 4s. per gall. Heavy, 1s. 9d. to 2s. per gall.

Intermediates and Dyes

In the following list of Intermediates delivered prices include packages except where otherwise stated:

ACID AMIDONAPHTHOL DISULPHO (1-8-2-4).—10s. 9d. per lb.

ACID ANTHRANILIC.—6s. per lb. 100 %.

ACID BENZOIC.—1s. 8½d. per lb.

ACID GAMMA.—4s. 6d. per lb.

ACID H.—3s. per lb.

ACID NAPHTHIONIC.—1s. 6d. per lb.

ACID NEVILLE AND WINTHER.—4s. 9d. per lb.

ACID SULPHANILIC.—8½d. per lb.

ANILINE OIL.—8d. per lb. naked at works.

ANILINE SALTS.—8d. per lb. naked at works.

BENZALDEHYDE.—2s. 3d. per lb.

BENZIDINE BASE.—3s. 3d. per lb. 100% basis d/d.

BENZOIC ACID.—1s. 8½d. per lb.

o-CRESOL 29/31° C.—5½d. per lb.

m-CRESOL 98/100%.—2s. 3d. to 2s. 6d. per lb.

p-CRESOL 32/34° C.—2s. 3d. to 2s. 6d. per lb.

DICHLORANILINE.—2s. per lb.

DIMETHYLANILINE.—1s. 11d. per lb.

DINITROBENZENE.—8½d. per lb. naked at works. £75 per ton.

DINITROCHLORBENZENE.—£84 per ton d/d.

DINITROTOLUENE.—48/50° C. 8d. per lb. naked at works. 66/68° C. 9d. per lb. naked at works.

DIPHENYLAMINE.—2s. 10d. per lb. d/d.

a-NAPHTHOL.—2s. per lb. d/d.

B-NAPHTHOL.—10d. per lb. d/d.

a-NAPHTHYLAMINE.—1s. 3d. per lb.

B-NAPHTHYLAMINE.—3s. per lb.

o-NITRANILINE.—5s. 9d. per lb.

m-NITRANILINE.—3s. per lb. d/d.

p-NITRANILINE.—1s. 8d. per lb.

NITROBENZENE.—6d. per lb. naked at works.

NITRONAPHTHALENE.—1s. 3d. per lb.

R. SALT.—2s. 2d. per lb.

SODIUM NAPHTHIONATE.—1s. 8½d. per lb. 100% basis d/d.

o-TOLUIDINE.—8d. per lb.

p-TOLUIDINE.—1s. 10d. per lb. naked at works.

m-XYLIDINE ACETATE.—2s. 6d. per lb. 100%.

N. W. ACID.—4s. 9d. per lb. 100%.

Wood Distillation Products

ACETATE OF LIME.—Brown, £10 5s. per ton. Good demand. Grey, £14 10s. to £15 per ton. Liquor, 9d. per gall.

CHARCOAL.—£6 to £9 per ton, according to grade and locality. Foreign competition severe.

IRON LIQUOR.—1s. 3d. per gall, 32° Tw. 1s. per gall. 24° Tw.

RED LIQUOR.—9d. to 10d. per gall.

WOOD CREOSOTE.—1s. 9d. per gall. Unrefined.

WOOD NAPHTHA, MISCIBLE.—3s. 11d. to 4s. 3d. per gall. Solvent, 4s. 3d. per gall.

WOOD TAR.—£4 to £5 per ton.

BROWN SUGAR OF LEAD.—£40 15s. per ton.

Rubber Chemicals

ANTIMONY SULPHIDE.—Golden, 6½d. to 1s. 5½d. per lb., according to quality; Crimson, 1s. 4d. to 1s. 6d. per lb., according to quality.

ARSENIC SULPHIDE, YELLOW.—1s. 9d. per lb.

BARYTES.—£2 16s. 10d. to £3 10s. per ton, according to quality.

CADMIUM SULPHIDE.—3s. 9d. to 4s. 6d. per lb.

CARBON BISULPHIDE.—£25 to £27 10s. per ton, according to quantity.

CARBON BLACK.—5½d. per lb., ex wharf.

CARBON TETRACHLORIDE.—£45 to £54 per ton, according to quantity. drums extra.

CHROMIUM OXIDE, GREEN.—1s. 2d. per lb.

DIPHENYLGUANIDINE.—3s. 9d. per lb.

INDIARUBBER SUBSTITUTES, WHITE AND DARK.—5d. to 6½d. per lb.

LAMP BLACK.—£35 per ton, barrels free.

LEAD HYPOSULPHITE.—9d. per lb.

LITHOPHONE, 30%.—£22 10s. per ton.

MINERAL RUBBER "RUBPRON."—£13 12s. 6d. per ton, f.o.r. London.

SULPHUR.—£9 to £11 per ton, according to quality.

SULPHUR CHLORIDE.—4d. to 7d. per lb., carboys extra.

SULPHUR PRECIP. B.P.—£55 to £60 per ton.

THIOCARBAMIDE.—2s. 6d. to 2s. 9d. per lb., carriage paid.

THIOCARBANILIDE.—2s. 1d. to 2s. 3d. per lb.

VERMILION, PALE OR DEEP.—7s. to 7s. 2d. per lb.

ZINC SULPHUR.—11d. per lb.

Pharmaceutical and Photographic Chemicals

ACID, ACETIC, PURE, 80%.—£39 per ton ex wharf London in glass containers.

ACID, ACETYL SALICYLIC.—2s. 4d. to 2s. 5d. per lb.

ACID, BENZOIC, B.P.—2s. to 3s. 3d. per lb., according to quantity. Solely ex Gum, 1s. 3d. to 1s. 6d. per oz., according to quantity.

Acid, Boric B.P.—Crystal, 36s. to 39s. per cwt.; powder, 40s. to 43s. per cwt.; extra fine powder, 42s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
Acid, Camphoric.—19s. to 21s. per lb.
Acid, Citric.—2s. 9d. to 3s. per lb.
Acid, Gallic.—2s. 8d. per lb. for pure crystal, in cwt. lots.
Acid, Pyrogallic, Crystals.—7s. 3d. per lb. Resublimed, 8s. 3d.
10½d. per lb.
Acid, Salicylic, B.P. pulv.—1s. 4½d. to 1s. 6d. per lb. Technical.—10½d. to 11½d. per lb.
Acid, Tannic B.P.—2s. 8d. to 2s. 10d. per lb.
Acid, Tartaric.—1s. 4½d. per lb., less 5%.
Acetanilide.—1s. 5d. to 1s. 8d. per lb. for quantities.
Amidol.—7s. 6d. to 9s. per lb., d/d.
Amidopyrin.—7s. 9d. to 8s. per lb.
Ammonium Benzoate.—3s. 3d. to 3s. 6d. per lb., according to quantity. 18s. per lb. ex Gum.
Ammonium Carbonate B.P.—£37 per ton. Powder, £39 per ton in 5 cwt. casks. Resublimated, 1s. per lb.
Atropine Sulphate.—9s. per oz.
Barbitone.—5s. 9d. to 6s. per lb.
Benzonaphthol.—3s. to 3s. 3d. per lb. spot.
Bismuth Carbonate.—9s. 9d. per lb.
Bismuth Citrate.—9s. 3d. per lb.
Bismuth Salicylate.—8s. 9d. per lb.
Bismuth Subnitrate.—8s. 3d. per lb.
Bismuth Nitrate.—Cryst. 5s. 9d. per lb.
Bismuth Oxide.—12s. 3d. per lb.
Bismuth Subchloride.—10s. 9d. per lb.
Bismuth Subgallate.—7s. 9d. per lb. Extra and reduced prices for smaller and larger quantities of all bismuth salts respectively.
Bismuthi et Ammon Liquor.—Cit. B.P. in W. Qts. 1s. 0½d. per lb.; 12 W. Qts. 11½d. per lb.; 36 W. Qts., 11d. per lb.
Borax B.P.—Crystal, 24s. to 27s. per cwt.; powder, 25s. to 28s. per cwt., according to quantity. Carriage paid any station in Great Britain, in ton lots.
Bromides.—Ammonium, 2s. to 2s. 3d. per lb.; potassium, 1s. 8½d. to 1s. 11½d. per lb.; sodium, 1s. 11d. to 2s. 2d. per lb.; granulated, ½d. per lb. less; all spot. Large quantities at lower rates.
Calcium Lactate.—B.P., 1s. 2½d. to 1s. 3d. per lb.
Camphor.—Refined flowers, 2s. 11d. to 3s. per lb., according to quantity; also special contract prices.
Chloral Hydrate.—3s. 2d. to 3s. 4d. per lb.
Chloroform.—2s. 5½d. to 2s. 7½d. per lb., according to quantity.
Creosote Carbonate.—6s. per lb.
Ethers.—S.G. ·730—11d. to 1s. 0d. per lb., according to quantity; other gravities at proportionate prices.
Formaldehyde, 40%.—37s. per cwt., in barrels ex wharf.
Guaiacol Carbonate.—4s. 6d. to 4s. 9d. per lb.
Hexamine.—1s. 11d. to 2s. 2d. per lb.
Homatropine Hydrobromide.—30s. per oz.
Hydrastine Hydrochloride.—English make offered at 120s. per oz.
Hydrogen Peroxide (12 vols.).—1s. 4d. per gallon, f.o.r. makers' works, naked. Winchesters, 2s. 11d. per gall. B.P., 10 vols., 2s. to 2s. 3d. per gall.; 20 vols., 4s. per gall.
Hydroquinone.—3s. 9d. to 4s. per lb., in cwt. lots.
Hypophosphites.—Calcium, 3s. 3d. per lb., for 28 lb. lots; potassium, 3s. 7d. per lb.; sodium, 3s. 6d. per lb.
Iron Ammonium Citrate.—B.P., 2s. 11d. to 3s. 2d. per lb. Green, 3s. 4d. to 3s. 7d. per lb.; U.S.P., 3s. to 3s. 3d. per lb.
Iron Perchloride.—18s. to 20s. per cwt., according to quantity.
Iron Quinine Citrate.—B.P., 8½d. to 9½d. per oz.
Magnesium Carbonate.—Light commercial, £31 per ton net.
Magnesium Oxide.—Light commercial, £62 10s. per ton, less 2½%; Heavy commercial, £21 per ton, less 2½%; in quantity lower; Heavy Pure, 2s. to 2s. 3d. per lb.
Menthol.—A.B.R. recrystallised B.P., 24s. 6d. per lb. net; Synthetic, 10s. 6d. to 11s. 6d. per lb.; Synthetic detached crystals, 10s. 6d. to 12s. 6d. per lb., according to quantity; Liquid (95%), 9s. 6d. per lb.
Mercurials B.P.—Up to 1 cwt. lots, Red Oxide, crystals, 8s. 4d. to 8s. 5d. per lb., levig., 7s. 10d. to 7s. 11d. per lb.; Corrosive Sublimate, Lump, 6s. 7d. to 6s. 8d. per lb., Powder, 6s. to 6s. 1d. per lb.; White Precipitate, Lump, 6s. 9d. to 6s. 10d. per lb., Powder, 6s. 10d. to 6s. 11d. per lb., Extra Fine, 6s. 11d. to 7s. per lb.; Calomel, 7s. 2d. to 7s. 3d. per lb.; Yellow Oxide, 7s. 8d. to 7s. 9d. per lb.; Persulph., B.P.C., 6s. 11d. to 7s. per lb.; Sulph. nig., 6s. 8d. to 6s. 9d. per lb. Special prices for larger quantities.
Methyl Salicylate.—1s. 3d. to 1s. 6d. per lb.
Methyl Sulphonal.—8s. 9d. to 9s. per lb.
Metol.—9s. to 11s. 6d. per lb. British make.
Paraformaldehyde.—1s. 9d. per lb. for 100% powder.
Paraldehyde.—1s. 4d. per lb.
Phenacetin.—2s. 5d. to 2s. 8d. per lb.
Phenazone.—3s. 9d. to 4s. per lb.
Phenolphthalein.—6s. to 6s. 3d. per lb.
Potassium Bitartrate 99/100% (Cream of Tartar).—94s. per cwt., less 2½ per cent.
Potassium Citrate.—B.P.C., 2s. 9d. to 3s. per lb.
Potassium Ferricyanide.—1s. 9d. per lb., in cwt. lots.
Potassium Iodide.—16s. 8d. to 17s. 2d. per lb., according to quantity.
Potassium Metabisulphite.—6d. per lb., 1-cwt. kegs included, f.o.r. London.
Potassium Permanganate.—B.P. crystals, 5½d. per lb., spot.
Quinine Sulphate.—1s. 8d. to 1s. 9d. per oz., bulk in 100 oz. tins.
Resorcin.—2s. 10d. to 3s. per lb., spot.
Saccharin.—47s. per lb.; in quantity lower.
Salol.—2s. 3d. to 2s. 6d. per lb.
Sodium Benzoate, B.P.—1s. 8d. to 1s. 11d. per lb.
Sodium Citrate, B.P.C., 1911—2s. 6d. to 2s. 9d. per lb., B.P.C. 1923—2s. 10d. to 2s. 11d. per lb. U.S.P., 2s. 9d. to 3s. per lb., according to quantity.
Sodium Ferrocyanide.—4d. per lb., carriage paid.
Sodium Hyposulphite, Photographic.—£15 per ton, d/d consignee's station in 1-cwt. kegs.
Sodium Nitroprusside.—16s. per lb.
Sodium Potassium Tartrate (Rochelle Salt).—95s. to 100s. per cwt. Crystals, 4s. per cwt. extra.
Sodium Salicylate.—Powder, 1s. 6½d. to 1s. 7d. per lb. Crystal, 1s. 7½d. to 1s. 8d. per lb.
Sodium Sulphide, pure recrystallised.—10d. to 1s. 1d. per lb.
Sodium Sulphite, Anhydrous.—£27 10s. to £28 10s. per ton, according to quantity. Delivered U.K.
Sulphonal.—6s. 6d. to 6s. 9d. per lb.
Tartar Emetic, B.P.—Crystal or powder, 2s. 1d. to 2s. 3d. per lb.
Thymol.—Puriss., 9s. 6d. to 9s. 9d. per lb., according to quantity. Firmer. Natural, 12s. 6d. per lb.

Perfumery Chemicals

Acetophenone.—6s. 6d. per lb.
Aubepine (ex Anethol).—11s. per lb.
Amyl Acetate.—2s. 6d. per lb.
Amyl Butyrate.—4s. 9d. per lb.
Amyl Salicylate.—2s. 9d. per lb.
Anethol (M.P. 21/22° C.).—5s. 3d. per lb.
Benzyl Acetate from Chlorine-free Benzyl Alcohol.—1s. 10d. per lb.
Benzyl Alcohol free from Chlorine.—1s. 10d. per lb.
Benzaldehyde free from Chlorine.—2s. 6d. per lb.
Benzyl Benzoate.—2s. 3d. per lb.
Cinnamic Aldehyde Natural.—15s. 6d. per lb.
Coumarin.—9s. per lb.
Citronellol.—13s. 6d. per lb.
Citral.—8s. per lb.
Ethyl Cinnamate.—6s. per lb.
Ethyl Phthalate.—2s. 9d. per lb.
Eugenol.—10s. 6d. per lb.
Geraniol (Palmarosa).—20s. per lb.
Geraniol.—6s. 6d. to 11s. per lb.
Heliotropine.—5s. per lb.
Iso Eugenol.—14s. 6d. per lb.
Linalol.—Ex Bois de Rose, 14s. per lb. Ex Shui Oil, 10s. 6d. per lb.
Linalyl Acetate.—Ex Bois de Rose, 17s. 9d. per lb. Ex Shui Oil, 14s. 6d. per lb.
Methyl Anthranilate.—8s. per lb.
Methyl Benzoate.—4s. per lb.
Musk Ketone.—34s. per lb.
Musk Xylol.—7s. per lb.
Nerolin.—3s. 9d. per lb.
Phenyl Ethyl Acetate.—11s. per lb.
Phenyl Ethyl Alcohol.—10s. 6d. per lb.
Rhodinol.—45s. per lb.
Safrol.—1s. 5d. per lb.
Terpineol.—1s. 6d. per lb.
Vanillin.—16s. 6d. per lb.

Essential Oils

Almond Oil.—Foreign S.P.A., 10s. 6d. per lb.
Anise Oil.—2s. 9d. per lb.
Bergamot Oil.—24s. per lb.
Bourbon Geranium Oil.—22s. per lb.
Camphor Oil.—9d. per lb.
Cananga Oil, Java.—12s. per lb.
Cinnamon Oil Leaf.—6s. 6d. per oz.
Cassia Oil, 80/85%.—7s. per lb.
Citronella Oil.—Java, 2s. 1d. per lb., c.i.f. U.K. port. Ceylon, pure, 2s. per lb.
Clove Oil (Pure 90/92%).—7s. 6d. per lb.
Eucalyptus Oil, Australian, B.P. 70/75%.—2s. per lb.
Lavender Oil.—Mont Blanc, 48/50%, Esters, 16s. 3d. per lb.
Lemon Oil.—14s. 6d. per lb.
Lemongrass Oil.—4s. per lb.
Orange Oil, Sweet.—20s. per lb.
Otto of Rose Oil.—Anatolian, 35s. per oz. Bulgarian, 75s. per oz.
Palma Rosa Oil.—12s. 6d. per lb.
Peppermint Oil.—Wayne County, 16s. per lb.; Japanese, 9s. 3d. per lb.
Petitgrain.—8s. per lb. Sandalwood, Mysore, 28s. per lb., 95% 19s. per lb.

London Chemical Market

The following notes on the London Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. R. W. Greeff & Co., Ltd., and Messrs. Chas. Page & Co., Ltd., and may be accepted as representing these firms' independent and impartial opinions.

London, October 25, 1928.

THE improvement in the demand for chemicals generally during the last week has been maintained, with export business improving.

General Chemicals

ACETONE is scarce and the price firm at £75 to £77 10s. per ton.
ACETIC ACID is unchanged.
ACID FORMIC.—£45 per ton for 85%, and in good demand.
ACID OXALIC.—£30 10s. to £32 10s. per ton, with a good demand.
ACID TARTARIC.—The upward tendency is maintained, and the position is very firm at 1s. 4½d. to 1s. 4¾d. per lb.
AMMONIUM CHLORIDE is unchanged.
ALUMINA SULPHATE.—£6 15s. to £7 per ton for 17/18%, iron free, with only very limited quantities available.
BARIUM CHLORIDE.—The position still remains very firm and supplies short; limited quantities are available at £11 5s. to £12 per ton, ex stock.
COPPER SULPHATE is unchanged.
CREAM OF TARTAR is firm at £98 10s. per ton, less 2½% for 99/100% B.P., with an upward tendency.
FORMALDEHYDE.—The demand remains good at £39 per ton, ex wharf London.
LEAD ACETATE is unchanged at £42 10s. for white and £41 10s. for brown.
LEAD NITRATE is firm at £36 10s. to £37 per ton.
LIME ACETATE is unchanged.
METHYL ACETONE is unchanged at £58 to £60 per ton for 45%, and in very good demand.
POTASSIUM CARBONATE is unchanged at £25 to £27 per ton for 96/98%.
POTASSIUM CHLORATE.—£28 per ton.
POTASSIUM PERMANGANATE.—5¼d. to 5½d. per lb.
POTASSIUM PRUSSIATE is unchanged at £63 10s. to £65 10s. per ton.
SODIUM ACETATE is unchanged at £21 10s. to £22 per ton.
SODIUM PHOSPHATE is in good demand at £12 to £13 per ton.
SODIUM PRUSSIATE is unchanged at 4⅝d. to 5d. per lb.
TARTAR EMETIC.—10¾d. per lb., and in fair demand.
ZINC SULPHATE is unchanged at £11 10s. to £11 15s. per ton

Coal Tar Products

The coal tar product market in general is quiet, and there is little change in prices to report from last week.
MOTOR BENZOL remains firm at 1s. 6d. per gallon, on rails, naked.
SOLVENT NAPHTHA remains very firm at 1s. 2¼d. per gallon, naked, at makers' works.
HEAVY NAPHTHA is unchanged at 1s. 1d. to 1s. 1½d. per gallon, on rails.
CREOSOTE OIL remains weaker, and can be bought at 5¾d. per gallon, f.o.r. in the North, and at 6¼d. per gallon in London.
CRESYLIC ACID is unchanged, the 98/100% quality being quote at 2s. 2d. per gallon, f.o.b., and the dark quality, 95/97%, is quoted at 1s. 10d. per gallon f.o.b., naked.
NAPHTHALENE remains firm at £5 per ton for the 74/76 qua ty, and £6 to £6 10s. per ton for the 76/78 quality.
PITCH.—There is no change to report; little business has been recorded, and buyers continue to show little interest. To-day's value is 40s. to 45s. per ton, f.o.b. U.K. port.

Latest Oil Prices

LONDON, October 24.—LINSEED OIL steady, unchanged. Spot, £29 15s.; November to April, £28 15s.; May-August, £28 17s. 6d.; and September-December, £29 7s. 6d., naked. RAPE OIL steady. Crude extracted, £41; technical refined, £43, naked, ex wharf. COTTON OIL steady. Egyptian crude, £30 10s.; refined common edible, £36; and deodorised, £38, naked, ex mill. TURPENTINE quiet. American, spot, 43s. 6d.; November-December, 43s. 9d.; and January-April, 45s. per cwt.

HULL, October 24.—LINSEED OIL.—Spot and October, £2 10s.; November-December, £29 7s. 6d.; January to August, £29 2s. 6d. per ton, naked. COTTON OIL.—Bombay crude, spot, £29 10s.; Egyptian crude, spot and November-February, £30 10s.; edible refined, spot and November-February, £34; technical, spot, £33 15s.; deodorised, spot, £36 per ton, naked. PALM KERNEL OIL.—Crushed, 5½ per cent., £37 10s. per ton, naked. GROUNDNUT OIL.—Crushed extracted, £37 10s.; deodorised, £41 10s. per ton. SOYA OIL.—Extracted and crushed, £32 10s.; deodorised, £36 per ton. RAPE OIL.—Crude extracted, £40 15s.; refined, £42 15s. per ton. TURPENTINE.—Spot, 45s. 6d. per cwt., net cash terms, ex mill. CASTOR OIL and COD OIL unaltered.

Nitrogen Products

SULPHATE OF AMMONIA.—The demand for sulphate of ammonia remains strong, and as supplies do not appear to be plentiful, the market is firmer at £9 11s. 9d. per ton, f.o.b. U.K. port, in single bags, for prompt shipment. Higher prices are quoted for forward delivery. It is reported from the United States that producers are hard put to it to deliver contractual requirements, and that export quotations have been withdrawn. Small lots available for prompt delivery have been sold at two to three dollars per ton premium over the nominal price of $2·40 to $2·45 per 100 lb., delivered in bulk Northern markets. In the home market sales continue on the normal low level at this season of the year.

NITRATE OF SODA.—The selling organisations set up in various countries are experiencing a satisfactory demand. The lower price at which the commodity is being offered are bound to stimulate consumption. Larger sales have been made for delivery in Europe and Egypt, but up to the present American sales are about the same as at this date last year. All sales have been made at the scale price of 16s. 4½d. per metric quintal, f.a.s. Chile.

South Wales By-Products

PATCHY conditions continue to be a feature of South Wales by-product activities. Business is moderate but values generally are unchanged and display a firm tendency. Pitch, which has not quite such a good demand, continues to change hands round the 45s. to 50s. per ton prompt delivery mark. Refined tars are unchanged, gaswork's tar selling at from 7¼d. to 7¾d. per gallon, delivered, and coke oven tar at from 7¾d. to 8d. per gallon delivered. Both have a steady, if moderate, demand. Crude naphthalene is slightly better at a quotation of from 80s. to 85s. per ton, but whizzed has practically no call round about 95s. to 100s. per ton. Patent fuel and coke exports continue to be unsatisfactory, but prices remain firm. Patent fuel exports during last week increased by slightly over 3,000 tons, but coke exports fell by over 1,000 tons. Prices, patent fuel, ex-ship Cardiff, 20s. to 21s. 6d.; ex-ship Swansea, 19s. 3d. to 19s. 9d. per ton. Coke, foundry, 25s. to 36s. 6d.; furnace, 19s. to 20s.; foundry, at oven, 27s. 6d. to 33s.; furnace, at oven, 19s. to 20s. per ton.

Scientific Operation of Marine Boilers

Some Interesting Installations

THE fact that steam generation is now a specialised branch of chemical engineering is beginning to be realised in marine engineering partly because of the continued advance of the marine Diesel engine. Obviously much more economical and scientific methods of operating "Scotch" marine boilers can be adopted, including furnace equipment, softening of make-up water, control of the firing by means of combustion recorders, (swung from a gimball joint), and the use of feed meters.

It is of interest in this connection, as showing the possibilities for even the smallest vessels, as that one of the best known shipping firms on the Yangtse River in China, with head-quarters in Shanghai, some time ago fitted a set of "turbine" forced draught steam jet furnaces on one of their ships, the ss. *Tseang Tah*, which has a three-flue cylindrical boiler. The results are reported to have been so satisfactory that a second and sister ship has been equipped in the same way, the ss. *Hsin Tseang Tah*, which in this case, however, has a modern type water tube boiler. Further, the latter ship has also had the "Donkey" boiler fitted. Incidentally, another field for economy on steamships is the equipment of such small boilers on proper lines, so as to be able to burn all the ship's cinders, for example, instead of good coal, a very wasteful proceeding to say the least of it, quite apart from the troubles with black smoke.

Further, as regards marine work, a number of "turbine" furnaces are also operating on dredgers in the Malay States in connection with tin mining, mostly using raw lignite as fuel, while the same equipment has been supplied to Chilean ships in order to burn the difficult local coal, which is friable and high in sulphur. The saving, however, in comparison with oil firing is very great.

Scottish Chemical Market

The following notes on the Scottish Chemical Market are specially supplied to* THE CHEMICAL AGE *by Messrs. Charles Tennant and Co., Ltd., Glasgow, and may be accepted as representing the firm's independent and impartial opinion.

Glasgow, October 24, 1928.

DURING the past week business in the heavy chemical market has remained fairly quiet, and there is no change of any importance to record.

Industrial Chemicals

ACETONE, B.G.S.—Nominally £74 10s. to £77 10s. per ton, ex wharf, according to quantity, but very little available for immediate delivery.

ACID ACETIC, 98/100%.—Glacial, £56 to £67 per ton, according to quality and packing, c.i.f. U.K. ports; 80% pure, £37 10s. per ton, ex wharf; 80% technical, £37 10s. per ton, ex wharf.

ACID BORIC.—Crystals, granulated or small flakes, £30 per ton. Powder, £32 per ton, packed in bags carriage paid U.K. stations.

ACID CARBOLIC, ICE CRYSTALS.—Price maintained at 6¼d. per lb., delivered or f.o.b. U.K. ports, in moderate demand.

ACID CITRIC, B.P. CRYSTALS.—Now quoted from 2s. 10d. to 3s. per lb., less 5%, ex wharf, but very little available even at these advanced figures.

ACID HYDROCHLORIC.—Usual steady demand. Arsenical quality, 4s. per carboy. Dearsenicated quality, 5s. 6d. per carboy, ex works, full wagon loads.

ACID NITRIC, 80°.—£24 10s. per ton, ex station, full truck loads.

ACID OXALIC, 98/100%.—On offer from the Continent at 3¼d. per lb., ex wharf. Spot material quoted 3½d. per lb., ex store. In better demand.

ACID SULPHURIC.—£2 15s. per ton, ex works, for 144° quality; £5 15s. per ton, for 168° quality. Dearsenicated quality, 20s. per ton extra.

ACID TARTARIC, B.P. CRYSTALS.—Quoted 1s. 4½d. per lb., less 5%, ex wharf; offered for prompt shipment at 1s. 4d. per lb., less 5%, ex wharf.

ALUMINA SULPHATE.—On offer at £5 10s. per ton, c.i.f. U.K. ports. Spot material quoted £5 15s. per ton, ex store.

ALUM, LUMP POTASH.—Quoted £8 7s. 6d. per ton, c.i.f. U.K. ports, prompt shipment from the Continent. Crystal meal quoted £8 10s. per ton, ex store.

AMMONIA ANHYDROUS.—Quoted 9½d. per lb., carriage paid. Containers extra and returnable.

AMMONIA CARBONATE.—Lump, £37 per ton; powdered, £39 per ton, packed in 5 cwt. casks, delivered or f.o.b. U.K. ports.

AMMONIA LIQUID, 880.—Unchanged at about 2½d. to 3d. per lb., delivered, according to quantity.

AMMONIA MURIATE.—Grey galvanisers' crystals of British manufacture quoted £21 to £22 per ton, ex station. Fine white crystals offered from the Continent at about £17 5s. per ton, c.i.f. U.K. ports.

ANTIMONY OXIDE, 98/100%.—On offer for prompt shipment from China at £39 10s. per ton, ex wharf.

ARSENIC, WHITE POWDERED.—Quoted £18 10s. per ton, ex wharf, prompt despatch from mines. Spot material on offer at £19 15s. per ton, ex store.

BARIUM CARBONATE, 98/99%.—Continental material quoted £10 per ton, c.i.f. U.K. ports. English material available at about £11 per ton, ex store.

BARIUM CHLORIDE.—Now quoted £9 15s. per ton, c.i.f. U.K. ports, prompt shipment from the Continent. Spot material on offer at £11 5s. per ton, ex wharf.

BLEACHING POWDER.—British manufacturers' contract price to consumers, £6 12s. 6d. per ton, delivered minimum 4 ton lots. Continental on offer at £6 10s. per ton, ex wharf.

CALCIUM CHLORIDE.—British manufacturers' price, £4 5s. to £4 15s. per ton, according to quantity and point of delivery. Continental material on offer at £3 12s. 6d. per ton, c.i.f. U.K. ports.

COPPERAS, GREEN.—Unchanged at about £3 10s. per ton, f.o.r. works, or £4 12s. 6d. per ton, f.o.b. U.K. ports for export.

COPPER SULPHATE.—Some spot material available at about £24 per ton, ex store.

FORMALDEHYDE, 40%.—Now quoted £36 per ton, c.i.f. U.K. ports. Spot material quoted at £38 5s. per ton, ex store.

GLAUBER SALTS.—English material unchanged at £4 per ton, ex store or station. Continental quoted £2 15s. per ton, c.i.f. U.K. ports.

LEAD, RED.—On offer at £29 10s. per ton, ex store.

LEAD, WHITE.—Quoted £36 10s. per ton, c.i.f. U.K. ports.

LEAD ACETATE.—White crystals quoted £41 15s. per ton, ex store. Brown on offer at about £40 per ton, ex store.

MAGNESITE, GROUND CALCINED.—Quoted £8 10s. per ton, ex store. In moderate demand.

METHYLATED SPIRIT.—Industrial quality 64 O.P. quoted 1s. 4d. per gallon, less 2½% delivered.

POTASSIUM BICHROMATE.—4½d. per lb., delivered, minimum 4-ton lots. Under 4-ton lots, ½d. per lb. extra.

POTASSIUM CARBONATE, 96/98%.—Offered from the Continent at £25 per ton, c.i.f. U.K. ports. Spot material available at £26 per ton, ex store.

POTASSIUM CHLORATE, 99¾/100%.—Powder quoted £23 per ton c.i.f. U.K. ports. Crystals 20s. per ton extra.

POTASSIUM NITRATE.—Refined granulated quality quoted £19 2s. 6d. per ton, c.i.f. U.K. ports. Spot material on offer at about £20 10s. per ton, ex store.

POTASSIUM PERMANGANATE, B.P. CRYSTALS.—Quoted 5¼d. per lb., ex wharf.

POTASSIUM PRUSSIATE (YELLOW).—Spot material quoted 6½d. per lb., ex store. Offered from the Continent at 6¼d. per lb., ex wharf, prompt shipment.

SODA CAUSTIC.—Powdered, 98/99%, £17 17s. 6d. per ton; solid, 76/77%, £14 10s. per ton; and 70/72%, £13 12s. 6d. per ton, minimum 4-ton lots, carriage paid on contract. Spot material 10s. per ton extra.

SODIUM ACETATE.—On offer for prompt delivery at about £21 5s. per ton, ex store.

SODIUM BICARBONATE.—Refined recrystallised, £10 10s. per ton, ex quay or station. M.W. quality, 30s. per ton less.

SODIUM BICHROMATE.—Quoted 3d. per lb., delivered buyers' works, minimum 4-ton lots. Under 4 and over 2-ton lots 1/16d. per lb. extra. Under 2-ton lots, 3½d. per lb.

SODIUM CARBONATE (SODA CRYSTALS).—£5 to £5 5s. per ton, ex quay or station. Powdered or pea quality 27s. 6d. per ton extra. Light soda ash, £7 3s. 9d. per ton, ex quay, minimum 4-ton lots, with various reductions for contracts.

SODIUM HYPOSULPHITE.—Large crystals of English manufacture quoted £8 17s. 6d. per ton, ex station, minimum 4-ton lots. Pea crystals on offer at £14 15s. per ton, ex station, minimum 4-ton lots.

SODIUM NITRATE.—Quoted £10 2s. per ton, carriage paid buyer's station, for ordinary quality. Refined quality 2s. 6d. to 5s. per ton extra.

SODIUM NITRITE, 100%.—In moderate demand. Spot material quoted 4½d. per lb., ex store.

SODIUM SULPHATE (SALTCAKE).—Prices 50s. per ton, ex works; 52s. 6d. per ton, delivered, for unground quality. Ground quality 2s. 6d. per ton extra.

SODIUM SULPHIDE.—Prices for home consumption:—Solid, 60/62%, £9 per ton; broken, 60/62%, £10 per ton; crystals, 30/32%, £7 2s. 6d. per ton, delivered buyer's works on contract, minimum 4-ton lots. Special prices for some consumers. Spot material 5s. per ton extra.

SULPHUR.—Flowers, £12 per ton; roll, £10 15s. per ton; rock, £10 12s. 6d. per ton; ground American, £9 5s. per ton, ex store.

ZINC CHLORIDE, 98%.—British material now quoted £22 10s. per ton, f.o.b. U.K. ports.

ZINC SULPHATE.—Offered from the Continent at about £10 5s. per ton, ex wharf.

NOTE.—The above prices are for bulk business and are not to be taken as applicable to small parcels.

Production of Gypsum in Canada

THE 1927 shipments of gypsum from Canadian deposits totalled 1,063,117 tons valued at $3,251,015 and established a new high record for the industry. In 1926, the production amounted to 883,728 tons worth $2,770,813. Gypsum quarried during 1927 totalled 1,105,704 tons, of which quantity 196,232 tons or 17·7 per cent. was calcined in Canada. Canadian crude gypsum exported amounted to 588,808 tons in 1927; this tonnage was shipped to the United States. Ground gypsum and prepared wall plaster exported during the year totalled 6,556 tons. The United States, New Zealand, Australia and Newfoundland were the principal importers of these materials.

A Conviction for Fraud

SENTENCE of fifteen months' imprisonment was passed on Tuesday at the Old Bailey on Edward Gordon Macrae Short, aged 69, who was found guilty of fraud and of obtaining credit without disclosing that he was an undischarged bankrupt. He was alleged to have obtained large sums of money by posing as heir to Scottish estates and a lairdship, and by saying that he had a valuable patent for extracting nitrates from the air. In the course of the evidence for the defence, Short stated that he applied for and obtained a provisional patent for the manufacture of nitrate in 1922. It lapsed in nine months, and he never lodged any complete specification.

Manchester Chemical Market

(From our Own Correspondent)

Manchester, October 25, 1928.

Although up to the present the takings of heavy chemical products by the textile industries against contract commitments shows little expansion, rather more optimistic views as to prospects in this direction are being expressed in some quarters, based on the belief of a pending improvement in cotton trade conditions. In other respects, the movement of chemicals continues on a moderate scale, with the demand on the open market somewhat patchy.

Heavy Chemicals

Prussiate of soda comes in for a fair amount of attention from buyers, and quotations in this section are well maintained at from 4½d. to 5¼d. per lb., according to quantity. No fresh weakness has occurred in respect of chlorate of soda, offers of which are at 2¾d. to 3d. per lb., with the current demand for this material rather slow. Bichromate of soda meets with a quietly steady demand, and at about 3d. per lb. there has been little change in prices. Caustic soda is quite firm at from £13 7s. 6d. to £15 7s. 6d. per ton, according to quality, and a fair amount of business is being put through against contracts. Phosphate of soda has been in slow inquiry, with quotations varying from about £12 5s. up to £12 10s. per ton. The demand for bicarbonate of soda this week has been up to its recent level, and values are firm at round £10 10s. per ton. With regard to hyposulphite of soda, prices hold up pretty well in spite of a somewhat slow inquiry, commercial crystals being on offer at £9 per ton and photographic at about £15 5s. per ton. Alkali keeps firm and is moving off in fair quantities at £6 2s. 6d. per ton. Sulphide of sodium has been inactive, but offers are steady at £9 15s. per ton for the 60-65 per cent. concentrated solid quality, and round £8 for the commercial. A quiet business is passing in the case of bleaching powder, and quotations remain at from £6 10s. up to £7 per ton. Salt-cake is in moderate request, with offers still on a contract basis of £2 12s. 6d. per ton.

Carbonate of potash is a firm section at from £25 10s. to £26 per ton, and a fair demand has been reported. Caustic potash seems to be rather quiet at the moment, but values are maintained on the basis of £33 5s. per ton for prompt delivery of one to five-ton lots. Yellow prussiate of potash is attracting a moderate volume of buying interest, and prices are steady at from 6¾d. to 7¼d. per lb., according to quantity. There has been little change in the position of bichromate of potash, and a fair trade is being done at round 4d. per lb. Chlorate of potash is selling in comparatively limited quantities at from 2¾d. to 3d. per lb. A quiet trade is passing in the case of permanganate of potash, with B.P. quality well held at round 5½d. per lb. and commercial at 5d. to 5¼d.

Reports regarding sulphate of copper are that inquiry for this material are on a fair scale, and at up to £25 10s. per ton, f.o.b., prices are steady. There is a quiet demand about for arsenic and no further weakness has developed, to-day's offers being at about £16 10s. per ton, on rails, for white powdered, Cornish makes. Offers of the acetates of lime are still not too plentiful, and values are firm at from £16 to £16 10s. per ton for grey material and round £9 for brown. Sales of acetate of lead are of moderate extent and quotations are fairly steady, with white at £40 10s. per ton, and brown at £39. Nitrate of lead continues in quiet demand at a top price of about £35 per ton.

Acids and Tar Products

The call for acetic acid this week has been fairly active, and values in this section keep up, with the commercial 80 per cent. on offer at £36 per ton and the glacial at about £66 10s. Oxalic acid is in limited request, but at 3¼d. to 3½d. per lb. there has been little change in prices. Citric acid is still very scarce, and quotations are nominally firm at 2s. 9d. per lb. Tartaric acid is steady and in moderate inquiry at about 1s. 4¼d. per lb.

There is a continued slow demand about for pitch, and values are weak at a maximum of about £2 per ton, f.o.b. Creosote oil, also, is on the easy side at 6d. per gallon, and here also business is relatively slow. Solvent naphtha is not too active, but prices are steady at 1s. 1½d. to 1s. 2d. per gallon. A fair trade is being done in carbolic crystals at round 6½d. per lb., with crude material currently quoted at from 2s. to 2s. 1d. per gallon.

The Possibilities of Peat

[From a Correspondent.]

Considerable attention is now being given to fuel resources and fuel utilisation, but the possibilities of peat in this connection is usually overlooked. Yet the world's peat resources are conserving a vast amount of energy, and if only 1 per cent. of all our solid fuel requirements were met by it, this would entail the use of 11,000,000 tons annually. In England and Scotland alone there are 9,500 square miles of peat, in Ireland, 4,700 square miles, in Canada 37,000 square miles, in Russia 65,000 square miles, in Finland 38,000 square miles, and in the United States 11,200 square miles of peat containing in that area alone over 13,000,000,000 tons of fuel. In several countries, research into the possibilities of the utilisation of these vast tracts is proceeding apace.

The Meunier Process

In France, by the Meunier process, alcohol is claimed to be produced from peat by an operation completed very rapidly. It is reported that one ton of peat yields 17 gallons of alcohol of 90 per cent. strength, and also by-products such as synthetic resin, acetic acid, formic acid and acetone. After these products are obtained, the residue is formed into briquettes with a greater calorific value than the raw material. M. Meunier, the inventor of the process, calculates that with good quality peat, the alcohol produced could be sold at 8½d. a gallon, after 20 per cent. interest on the capital involved had been paid. This position is brought about by the fact that the Meunier process claims to produce from raw peat as a by-product sufficient fuel to provide the heat necessary for the production of alcohol, and even to have a balance of such fuel for sale. The Government of the Irish Free State proposes to carry out trials to demonstrate the net cost of producing crude alcohol from peat.

In this country, too, considerable headway is being made in perfecting processes which will make the utilisation of peat a commercial proposition. Progress has to some extent been held up since the war, because of the necessity of introducing mechanical methods for cutting and handling the peat.

Methods of Drying

In Europe generally, before the war, these operations were conducted by hand, but the great increase in labour costs necessitated the perfecting of mechanical methods. Then, again, numerous and costly failures have resulted from attempts to accomplish the drying of peat, which is 90 per cent. water, by what may be termed artificial methods. No amount of pressure alone has ever succeeded in expelling the moisture from peat and it was for long held that a natural air drying process was the only one giving reasonable hope of success, and mechanical aids have been perfected for this purpose.

In Scotland, a new drying process, of considerable promise was found too expensive, and methods to lower the cost were initiated, which have now resulted in a cost reduction of nearly 40 per cent., so that it is confidently stated that a commercial process for drying peat has been found which will be low in operating and labour costs, and does not require very skilled attention. The soundest results will, it is anticipated, be obtained by concentrating on electric power generation from peat with briquettes as a by-product, obtained by the spare heat from the electrical generation.

Peat has a variety of uses apart from being a fuel (particularly in metallurgy) because of the absence of phosphorous and sulphur, and as an alcohol producer. It is a potential source of ammonia, its charcoal is excellent for tempering cutlery steel, while in the manufacture of gunpowder, its charcoal is superior to that of dogwood and alder. The long fibre can be spun and dyed and will make paper and mill board and act as a substitute for papier-mache. Being soft and pliable as well as remarkably absorbent, it provides an excellent substitute for wadding. There are still great advances to be made in perfecting this variety of uses, particularly in rendering them commercially profitable.

The future of peat as a fuel and as a substitute is nevertheless of great moment, and with the interest now being taken in fuel research and the production of alcohol, its advantages will become increasingly recognised.

Company News

N. V. Van den Bergh's Factory.—An interim dividend of 7½ per cent. has been declared.

Olympic Portland Cement.—The directors have declared an interim dividend of 5 per cent., less income tax, in respect of 1928, payable on November 15.

Babcock and Wilcox.—An interim dividend of 7 per cent., tax free, is announced on the ordinary shares, on account of the year ending December 31 next.

Bryant and May.—The board has declared a dividend on the preference shares at the rate of 7 per cent. per annum for the half year to September 30, less tax. An interim dividend of 6 per cent., actual, free of tax, on the ordinary shares and 5 per cent., actual, free of tax, on the partnership shares, all payable on October 31.

Herbert Morris, Ltd.—After making allowance for income tax there is a profit from trading for the year ended July 31 last of £95,022, to which is added £9,323 dividends from investments, £9 transfer fees, etc., and £52,386 brought in. After deducting directors' fees, preference dividends for the year, ordinary dividend for the first half-year and depreciation, there is a disposable balance of £108,952. The directors recommend the payment of a further dividend on the ordinary shares, making a total of 15 per cent. (free of income tax) for the year, and placing of £20,000 to reserve, leaving £52,952 to be carried forward.

Anglo-Persian Oil Co., Ltd.—It is announced that at a meeting of the directors of the Anglo-Persian Oil Co., Ltd., held on October 19, it was decided, after allocating a total of £800,000 to the several reserve funds and £453,000 to extra depreciation, to recommend, at the annual meeting to be held on November 6, that a dividend of 7½ per cent., less income tax, be paid on the ordinary shares for the year ended March 31, 1928, and to carry forward, subject to excess profits duty, the sum of £2,224,266. For 1926-27 the allocations to the reserve funds totalled £1,300,000, and there was placed to extra depreciation £450,000; the dividend was 12½ per cent., less tax, and there was carried forward £2,246,879.

Clay Absorbents for Refining Lubricating Oils

Although edible oils have for years been purified by agitation with finely ground absorbents, states the United States Bureau of Mines, until recently only percolation systems were used to clarify petroleum products. Fuller's earth has been used almost exclusively as the clarifying medium. In recent years, the discovery of "clays" with oil clarifying properties analogous to fuller's earth has resulted in new and improved methods for the purification of petroleum products. The Rare and Precious Metals Experiment Station of the United States Bureau of Mines, Department of Commerce, at Reno, Nevada, has completed a study on certain properties of "oil bleaching clays" comparing the standard clays used on the Pacific Coast in oil refining with the usual fuller's earth. The efficiency of each "clay" is determined by experiments on the particular oil in question. There are two classes of clays that are now competitors with fuller's earth for bleaching oils. One is used raw, the other requires preliminary acid treatment. The raw clays examined resemble sepiolite (meerschaum). They are non-plastic, float on water, and lose their bleaching property if heated to 450° C., or if they are leached with acid. The clays requiring acid treatment to condition them for bleaching oils may be either plastic or non-plastic. They may resemble bentonite in swelling properties and give basic reaction to phenolphthalein. The best residual products were obtained after leaching with 15 to 20 per cent. by weight of sulphuric acid. This product will not lose its bleaching property if heated to 600° C., and after use might be revivified by heat. The acid-treated clays are from one to five times more efficient than raw clays. A Wyoming bentonite with acid reaction to phenolphthalein after acid-conditioning showed excellent bleaching properties. Several other bentonites with basic reaction to phenolphthalein could not be conditioned to clarify oil. In experiments with several specimens of pure clay minerals only montmorillonite, after conditioning with acid, gave high oil clarifying properties. A microscopic study of an acid-treated clay, now used in commercially refining lubricating oil, indicated clay products as alteration of obsidian, possibly containing montmorillonite.

The Nature of Beet Sugar Effluent

Investigations at Rothamsted

Some of the results of investigations into the nature of beet sugar effluent were explained on Thursday, October 19, to Lord Stradbroke, Parliamentary Secretary to the Ministry of Agriculture, when he joined in the annual inspection and visitation of the Lawes Agricultural Trust Committee to the Rothamsted Experimental Station.

The investigation is being carried out in the mircro-biological department. It has been found that the effluent is not poisonous, but contains a high proportion of matter which is readily oxidisable, and, upon entering the rivers, immediately makes use of the dissolved oxygen contained in the water. The fish, thus deprived of a prime necessity of life, die from suffocation. Having established this, the Department has started experiments with filters to deal with the effluent, and success has been achieved with bacterial filters which give 95 per cent. purity in the effluent. The problem at the moment is to deal with the amount of effluent produced, or, in other words, to adapt the experiment to the needs of commerce, and some members of the Research Station staff are at the Colwick sugar beet factory, near Nottingham, studying it. The problem is urgent, for 1,000 tons of beet sliced produces about 3,500,000 gallons or effluent, which is just as dangerous to normal plant and fish life as the sewage from a town of 40,000 people.

Nationalities in the Chilean Nitrate Industry

According to Consul R. R. Bradford, of the chemical division of the U.S. Bureau of Fertiliser and Domestic Commerce, an attempt has been made to ascertain the nationality of the companies or individuals mentioned in the Nitrate Producers Association's list of owners of Chilean nitrate plants. There are 152 names and the following table shows approximately the correct percentage of the nationality of the controlling interests in the Chilean nitrate industry. The percentages have no reference to production.

Nationality.	Percentage.
Yugoslav	32·2
British	18·4
British-Chilean	9·2
Chilean	8·5
Spanish	7·2
German	5·2
American	4·6
Spanish-Chilean	3·9
Chilean-Peruvian	2·6
American-Chilean-British	2·6
Peruvian	1·9
French-Chilean	1·3
Yugoslav-Chilean	1·3
Bolivian	0·6

Smokeless Fuel in Canada

Major S. J. Robins, president of Canadian Carbonised Coals Ltd., has just returned to Canada from England, where he has been studying smokeless fuel processes. Major Robins declares that the importation of Pennsylvania coal will be unnecessary, as it can be replaced by bituminous fuel from the Maritime and Prairie Provinces. Major Robins has returned with rights in the Illingworth carbonising process. He states that plans have been made to construct a plant at Prescott, Ontario, capable of handling 300 tons of soft coal daily, producing a solid product that should prove a strong competitor with American anthracite, which is now imported in large quantities. The bituminous coal will be carried in ships from Nova Scotia to Ontario throughout the season of open navigation in sufficient quantities to enable the plant to continue through the winter. Already Ontario has made an experiment in shipping Alberta soft coal at a special railway rate arranged by the Dominion Government, while similar proposals by Nova Scotia have figured in the constructive programme put forward recently by the Maritimes to remedy their backward condition. During the last American coal strike an embargo was laid upon exports to Canada, which created a serious situation, both industrially and domestically.

Commercial Intelligence

The following are taken from printed reports, but we cannot be responsible for any errors that may occur.

County Court Judgments

[NOTE.—The publication of extracts from the "Registry of County Court Judgments" does not imply inability to pay on the part of the persons named. Many of the judgments may have been settled between the parties or paid. Registered judgments are not necessarily for debts. They may be for damages or otherwise, and the result of bona-fide contested actions. But the Registry makes no distinction of the cases. Judgments are not returned to the Registry if satisfied in the Court books within twenty-one days. When a debtor has made arrangements with his creditors we do not report subsequent County Court judgments against him.

ATKINSON (E. B.) AND CO. (HULL), LTD., 24, Dock Street, Hull, chemical suppliers. (C.C., 27/10/28.) £35 os. 1d. September 19.

HALL AND PROVAN, 43, South Lane, Rochdale, manufacturing chemists. (C.C., 27/10/28.) £11 8s. 10d. September 14.

Mortgages and Charges

*[NOTE.—The Companies Consolidation Act of 1908 provides that every Mortgage or Charge, as described therein, shall be registered within 21 days after its creation, otherwise it shall be void against the liquidator and any creditor. The Act also provides that every Company shall, in making its Annual Summary, specify the total amount of debts due from the Company in respect of all Mortgages or Charges. The following Mortgages and Charges have been so registered. In each case, the total debt, as specified in the last available Annual Summary, is also given—marked with an *—followed by the date of the Summary, but such total may have been reduced.]*

EXPRESS DYEING AND CLEANING CO., LTD., London, W. (M., 27/10/28.) Registered October 3, £300 (not ex.) and £000 (not ex.)charges, to bank; charged on 54 and Northfield Works, both Northfield Road, Ealing. *£2,000. August 5, 1927.

NITRO-CELLULOSE EXPLOSIVES CO., LTD., London, W.C. (M., 27/10/28.) Registered October 11, £500 debentures, part of £12,500; general charge.

Receivership

VANORE, LTD. (R., 27/10/28.) W. F. Baker, of 93, Mortimer Street, W.1, was appointed Receiver and Manager on October 3, under powers contained in 1st mortgage debentures dated April 20, 1928.

London Gazette, &c.

Company Winding Up Voluntarily

THOROLD'S PURE LIME AND HYDRATE CO., LTD. (C.W.U.V., 27/10/28.) At an extraordinary general meeting of the above-named company, held at 37, Chester Square, S.W.1, on October 12, 1928 (James E. Thorold, chairman), the subjoined extraordinary resolution was passed: "That it has been proved to the satisfaction of this meeting that the company cannot, by reason of its liabilities, continue its business and that it is advisable to wind up the same, and, accordingly that the company be wound up voluntarily; and that A. Cyril Sharwood, of 36, Wallbr ok, E.C.4, Chartered Accountant, Clerk to Messrs. Kemp, Chatteris, Nichols, Sendell and Co., be and he is hereby appointed liquidator for the purposes of such winding-up." Pursuant to section 188 of the Companies (Consolidation) Act, 1908, a meeting of the creditors will be held at the King's Arms Hotel, Wood Street, Swindon, on Thursday, November 1, 1928, at 11.30 a.m.

Notice of Dividend

LEEDHAM, Edwin, carrying on business at Bromley Street, Kingston-upon-Hull, fertiliser and feeding stuffs manufacturer. First and final dividend, 7¾d. per £, payable October 24, Official Receiver's Office, 37, Scale Lane, Hull.

Partnership Dissolved

RUSHWORTH, WILMORE AND CO (Charles Edgar RUSHWORTH and Walter Nelson WILMORE), soap and chemical manufacturers, Dalton Works, Hard Ings Lane, Keighley, by mutual consent, as from the first day of July 1928. C. E. Rushworth having died on August 11, W. N. Wilmore has taken into partnership his nephew, Tom Wilmore, and they will together continue the business under the old style.

New Companies Registered

ACETATE AND ACETATE PRODUCTS (FOREIGN RIGHTS), LTD., Dashwood House, 69, Old Broad Street, London. Registered as a public company on October 20. Nom. capital, £200,000 in 2s. shares. To adopt an agreement with the European and General Non-Inflammable Film Syndicate, Ltd., and to carry on the business of manufacturers, merchants and agents for celluloid goods, cellulose lacquers, crestaline, brushing paints and imitation mother-of-pearl products, chemists, manufacturers of and dealers in paints, varnishes, oils and pigments, artificial silk, celluloid and plastic materials, etc.

ALCOCK (PEROXIDE), LTD., 8, Great Winchester Street, London, E.C.2. Registered October 22. Nom. Capital, £14,000 in 12,500 7½ per cent. cumulative preference shares of £1 each and 30,000 ordinary shares of 1s. each. Chemical and soap manufacturers, drysalters, manufacturers of and dealers in all kinds of chemical, industrial and other preparations, particularly the preparations known as peroxide of hydrogen, barium peroxide, blanc fixe, perborate of soda, paints and pigments, manufacturers of and dealers in soap powder, drysalteries for dyeing, bleaching and laundry use, etc. A director: H. E. Alcock, "The Knoll," Luton, chemical manufacturer (life governing director).

BAYNARDS FULLERS EARTH CO., LTD., 106, Fenchurch Street, London, E.C.3. Private company. Registered October 18. Nom. capital, £2,000 in £1 shares. To acquire and accept transfers of the mortgage securities set forth in an agreement with F. W. Berk and Co., Ltd., to acquire and turn to account any lands, buildings and other premises in the Parishes of Baynards and Cranleigh, Surrey, or elsewhere in the U.K., and to carry on the business of manufacturers of and dealers in fullers' earth, cement, concrete, lime, clay, etc. Directors: P. F. Berk, 17, Beckenham Road, Beckenham, A. D. Berk, A. F. Berk, J. Kershaw, J. Young.

BRITISH ALKALOIDS, LTD. Registered as a public company on October 23. Nom. capital £150,000 in 100,000 participating preference shares of £1 each and 1,000,000 ordinary shares of 1s. each. To acquire the undertaking of British Alkaloids, Ltd. (incorporated in 1916); to adopt two agreements with Eastern Rubber Growers, Ltd., and to carry on the business of manufacturing chemists, manufacturers and merchants of, agents for and dealers in toilet, pharmaceutical, medicinal, industrial and other preparations, essential oils, drugs, dyeware, pigments, etc. A subscriber: F. J. Groombridge, 161, Winns Avenue, Walthamstow, London.

CHEMICAL AND DETERGENT CO., LTD. Registered October 20. Nom. capital, £1,000 in £1 shares. To acquire the business of a manufacturer of substances for cleaning now carried on by J. S. Cattell at 57 and 58, Chancery Lane, and at Well Street, Hackney, as "The Chemical and Detergent Co." A director: J. S. Cattell (chairman), 45, Canonbury Square, London, N.5.

COLLOIDAL PRODUCTS, LTD., 5, Wine Office Court, Fleet Street, London. Registered October 19. Nom. capital, £3,000 in £1 shares. Manufacturers, importers and exporters of and dealers in colloidal products, collodion, pyroxylin plastics, celluloids, cinematograph and photographic films, cellulose, cellulose-acetate, nitro-cellulose, acetated and nitrated products, paints, varnishes and lacquers, etc. Directors:—G. G. Proctor (chairman), M. E. R. Hublou, C. J. Steurs, F. D. M. Harding.

HASLAM AND NEWTON, LTD. Registered as a public company on October 20. Nom. capital £450,000 in 250,000 cumulative preference shares of £1 each and 1,000,000 ordinary shares of 4s. each. To adopt agreements (*a*) with the Haslam Foundry and Engineering Co. (1927), Ltd., and (*b*) with Newton Brothers (Derby), Ltd., and to carry on the business of manufacturers of and dealers in machinery of all descriptions; refrigerating and regrigerating plants, artificial silk, chemical and distillation plants, etc. A subscriber: G. W. Waspe, 325, Hertford Road, Waltham Cross.

PETROLEUM REFINERIES, LTD. 39, Grosvenor Place, London, S.W.1, Registered as a private company on October 19 Nom. capital, £100 in £1 shares. To carry on the business of refiners, producers, storers, suppliers and distributors of petroleum, petroleum products, oils, hydrocarbons and similar products, etc.